ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 704 and 799

[OPTS-42051A; FRL 3736-2]

RIN: 2070-AB07

Glycidol and Its Derivatives Category; Proposed Test Rule With Reporting and Recordkeeping Requirements

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA, under section 4 of the Toxic Substances Control Act (TSCA), is proposing that manufacturers and processors of chemical substances listed on the public or confidential portions of the TSCA section 8(b) Chemical Substance Inventory that belong to the "Category of glycidol and its derivatives" (hereinafter referred to as "glycidyls"), be required to perform health effects testing. EPA is also proposing under TSCA section 8(a) that manufacturers and importers of glycidyls be required to report to EPA the volume of manufacture and importation of the substances in accordance with 40 CFR part 704 to allow EPA to determine when certain tests are to be performed.

DATES: Submit written comments on or before February 5, 1991. If persons request an opportunity to submit oral comment by February 5, 1991, EPA will hold a public meeting on this rule in Washington, DC.

ADDRESSES: Submit written comments, identified by the document control number (OPTS-42051A), in triplicate to: TSCA Public Docket Office (TS-793), rm. NE-G004, Office of Toxic Substances, Environmental Protection Agency, 401 M St., SW., Washington, DC 20460. A public version of the administrative record supporting this action (with any confidential business information deleted) is available for inspection at the above address from 8 a.m. to noon, and 1 p.m. to 4 p.m., Monday through Friday except legal holidays.

For further information on arranging to speak at the public meeting, see Unit IX. of this preamble, and contact: Mary Louise Hewlett, Chemical Testing Branch (TS-778), rm. NE-100, Office of Toxic Substances, Environmental Protection Agency, 401 M St., SW.,

FOR FURTHER INFORMATION CONTACT: David Kling, Director, Environmental Assistance Division (TS-799), Office of Toxic Substances, rm. E-543B, 401 M St., SW., Washington, DC 20460, (202) 554-1404, TDD (202) 554-0551.

SUPPLEMENTARY INFORMATION: EPA is issuing a proposed test rule under section 4(a) of TSCA requiring health effects testing of chemical substances falling within the chemical category of glycidyls. For purposes of this proposed rule, EPA has defined "glycidyls" as glycidol itself and any of its esters or ethers which are currently listed on, or are subsequently listed on, the public or confidential portions of the TSCA section 8(b) Inventory of Chemical Substances. Under TSCA section 8(a), EPA is also proposing annual reporting by manufacturers (including importers) of production and/or importation volumes for these substances to determine when certain testing will begin. The glycidyls are a complicated category of chemicals that present many unique factors to consider in developing an appropriate test rule. Although EPA is proposing this test rule, EPA expects to seriously consider all alternative approaches and may promulgate a test rule that is substantially different from today's proposal. Because of the length and complexity of this proposed rule, the following Table of Contents is presented as an aid to the reader.

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I. Introduction

A. Overview

1. *Testing required by the rule.* Under this rule, EPA is proposing a testing scheme based on subcategories of related substances as well as individual substances. EPA recognizes that not all glycidyls listed on the public or confidential portions of the TSCA Inventory of Chemical Substances are in current production, and that some members of the category may be used as substitutes for others. Therefore, to mitigate testing costs and to prevent manufacturers and processors from switching production from one substance to another to avoid testing requirements, EPA is proposing a cost-sharing testing mechanism using subcategories of substances. EPA would select one substance within a subcategory for testing which would be paid for by manufacturers and processors of all the substances within the subcategory. The mutagenicity and oncogenicity data from the representative member would then be used for risk assessment for all members of the subcategory.

For subcategories of substances produced in aggregate quantities of at least 1 million pounds per year and less than 10 million pounds per year, EPA proposes that one member of the subcategory be tested for: Subchronic toxicity, developmental toxicity screening, mutagenicity screening, and subchronic neurotoxicity.

For subcategories of substances produced in aggregate quantities of 10 million pounds or greater per year, EPA proposes that one member of the subcategory be tested for: Subchronic toxicity, developmental toxicity, reproductive toxicity, neurotoxicity (subchronic and acute), mutagenicity and oncogenicity.

Any subcategory which reached the aggregate production volume trigger of 1 million pounds at one given time and, subsequently, reached the 10 million pound trigger at another time, would be subject to both testing batteries, each one conducted when the respective production volume trigger was met. Under section 8(a) of TSCA, EPA shall, by rule, require the manufacturers and processors of a chemical substance to maintain specific records and submit reports to EPA. To determine when certain testing is triggered, EPA is proposing under section 8(a) of TSCA to require annual reporting by manufacturers (including importers) of production and importation volumes for all substances meeting the definition of this chemical category.

In addition to testing requirements based on the production volume of a subcategory, if EPA has a concern for subchronic, developmental, reproductive, or neurotoxic effects based on preliminary data on a particular substance, EPA would require immediate testing of that substance only by the manufacturers and processors of that substance. If EPA has a concern for mutagenicity based on preliminary data on any substance within a subcategory, EPA would require immediate mutagenicity testing of a representative member of that subcategory by the manufacturers and processors of all the substances within that subcategory. The entry assay within the tiered mutagenicity testing schemes for gene mutation and chromosomal aberration would depend on the last test for which data are available and adequate for any member of the subcategory. If EPA has a concern for oncogenicity based on preliminary data on any substance within a subcategory, EPA would require immediate testing of a representative member of the substances within the subcategory by the manufacturers and processors of all the substances in the subcategory only if the aggregate annual subcategory production volume is also in excess of 10 million pounds per year.

2. *Other considerations.* This rule adopts an innovative approach for rules under section 4 of TSCA in that EPA is making findings for an entire category of substances. EPA is proposing to make these "category-wide" findings under both section 4(a)(1)(A) and section 4(a)(1)(B) of TSCA. (See Unit IV. of this preamble) EPA is basing the TSCA section 4(a)(1)(A) findings on available data and application of structure-activity relationships (SAR).

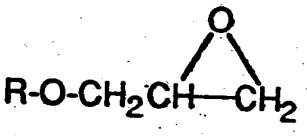
As a category rule, the proposed rule would apply to both existing and new substances. A glycidyl derivative not on the TSCA section 8(b) inventory would go through the premanufacture notification (PMN) process under TSCA section 5(a) and be entered on the inventory after beginning production. TSCA section 5 requires that, when a category of substances is subject to a TSCA section 4 test rule, any PMN submission on a member of the category must include the required test data. However, EPA does not intend to make compliance with these data requirements a condition for submitting a PMN, but rather will defer compliance until after the substance is reported to the TSCA Inventory. (See Units III.B., III.G., and V.D. of this preamble)

Any glycidyls category member on the TSCA inventory that is in production at the time of final test rule promulgation would be a candidate for immediate testing, but, as described below, might escape designation as a test substance. A TSCA section 8(a) annual reporting rule, proposed together with this test rule, would provide the means for EPA to monitor substance and subcategory production. (See Unit III.G. of this preamble)

Because new data may appear between the date the final rule is issued and the date testing is triggered, EPA proposes to let test sponsors submit such new data before it notifies sponsors to begin testing. (See Unit V.A. of this preamble)

B. ITC Recommendation

The Interagency Testing Committee (ITC) designated the category of "glycidol and its derivatives" for health effects testing. The reasons for this designation are discussed in the Federal Register of October 30, 1978 (43 FR 50630). This chemical category was defined by the ITC as all substances of the general formula:



where R is a hydrogen atom or any alkyl, aryl, or acyl group. R is unrestricted as to the number and type of substituents it may carry.

C. Test Rule Development Under TSCA

Under section 4(a) of TSCA, EPA shall, by rule, require testing of a chemical substance or mixture (substance) to develop appropriate test data if the Administrator makes certain findings as described in TSCA under section 4(a)(1)(A) or (B). Detailed discussions of the statutory TSCA section 4 findings are provided in EPA's first and second proposed test rules which were published in the Federal Register of July 18, 1980 (45 FR 48528) and June 5, 1981 (46 FR 30300).

Under TSCA section 26, EPA has authority to take any action authorized or required to be taken with respect to a chemical substance or mixture that may be taken with respect to a category of substances or mixtures. TSCA section 26(c)(2) defines "category of chemical substances" to mean:

a group of chemical substances the members of which are similar in molecular structure, in physical, chemical, or biological properties, in use, or in mode of entrance into the human body or into the environment, or the members of which are in some other way suitable for classification as such for purposes of this Act, except that such term does not mean a group of chemical substances which are grouped together solely on the basis of their being new chemical substances.

Thus, the term "category of chemical substances" is quite broad.

In evaluating the testing needs for the glycidyls, EPA considered all available relevant information, including the following: Information presented in the ITC's report recommending testing consideration; production volume, use, exposure, and release information reported by manufacturers of glycidyls under the TSCA section 8(a) Preliminary Assessment Information Rule (40 CFR part 712); health and safety studies submitted under the TSCA section 8(d) Health and Safety Study Reporting Rule (40 CFR part 716) for glycidyls; and published and unpublished data available to EPA. EPA also considered public comments on the advance notice of proposed rulemaking for testing of glycidyls under section 4(a) of TSCA (hereinafter "ANPR") that was published in the Federal Register of December 30, 1983 (48 FR 57562ting for the glycidyls under TSCA section 4(a)(1)(A) and (B).

D. Activities Since the Advanced Notice of Proposed Rulemaking (ANPR)

Since publication of the ANPR on December 30, 1983, EPA has evaluated public comments and incorporated EPA's responses to these comments in a separate support document (Ref. 1), entitled "Support Document for Glycidol and its Derivatives: Responses to Public Comments on the Advance Notice of Proposed Rulemaking (December, 1989)".

In addition, EPA compiled a technical support document for glycidol and its derivatives (Ref. 2). This document includes data on the identity and chemical/physical properties of the substances contained in this chemical category, as well as information on the production, uses, chemical fate, human exposure, and health effects for these substances. Data obtained in comments on the ANPR, as a result of TSCA section 8(d) or (e) submissions, or as a result of publication in the open scientific literature subsequent to the issuance of the ANPR, were included in this document. Subsequently, EPA summarized the information in the technical support document (Ref. 2), as well as more recent information from other sources, in an additional support document for glycidyls (Ref. 3) outlining the data supporting EPA's findings under section 4(a)(1)(A) of TSCA for certain of the substances contained in the category.

A meeting was held on May 17, 1984, between representatives from the Epoxy Resins Program Panel of the Chemical Manufacturers Association (CMA) and EPA personnel concerning this chemical category. Meetings were also held on January 25, 1989, and May 17, 1989, between EPA and representatives of various working units of the Society of the Plastics Industry, Inc (SPI). An Epoxides Workshop was held on April 25, 1990, at which EPA personnel and representatives of SPI were scheduled to discuss, among other topics, the glycidyls testing category as it relates to the broader issues posed by epoxides in general. Although EPA subsequently withdrew the glycidyls testing presentation, a copy of the overhead projection slides, which were supplied in advance to SPI, has been placed in the record for this rulemaking. Summaries of the meetings held, as well as copies of all support documents, have been placed in the record for this rulemaking.

II. Review of Available Data

A. Profile

The chemical structures and physical and chemical properties of the 66 substances listed on the public portion of the TSCA section 8(b) Chemical Substance Inventory, which fall within the glycidyls definition, are presented in the technical support document (Ref. 2). As described in Unit III.C.1. of this preamble, for the purposes of this test rule, these 66 substances have been divided to yield glycidol itself and 21 subcategories of its derivatives, using SAR principles (considering only molecular structure and observed health effects). The chemical substances for which reports have been received pursuant to the Inventory Update Rule (40 CFR part 710, subpart B), or for which EPA has obtained other data which indicate recent production and/or importation, are identified by footnote in the subcategorization scheme presented in Unit III.C.1. of this preamble.

B. Production

Glycidol may be produced by reacting perbenzoic acid with allyl alcohol or by reacting glycerol-1-monochlorohydrin with alcoholic potassium hydroxide or metallic sodium in ether (Ref. 4). The glycidyl derivatives are produced by reacting epichlorohydrin with a compound having one or more active hydrogen atoms, followed by dehydrohalogenation with a suitable base (Ref. 5). On the basis of information obtained from the Inventory Update Rule (40 CFR part 710, subpart B) or from other sources, EPA estimates that recent annual production volumes (mostly data for 1985) for the monomeric substances contained in this chemical category have totalled as much as 25 million pounds (Ref. 6). In addition, EPA estimates that the total annual production volume for these monomeric substances has reached approximately 343 million pounds, including the volumes of monomeric substances present in significant amounts as byproducts in epoxy resins (Ref. 7). These monomeric substances arise as unavoidable byproducts during the manufacture of epoxy resins.

C. Uses

Glycidyls' uses are listed in the technical support document (Ref. 2). Glycidol is primarily used as a stabilizer during the production of certain vinyl polymers. Glycidol ethers and esters are mainly used as reactive diluents in the production of epoxy resins, which are then reacted with curing agents to yield high-performance thermosetting plastics, used in a large variety of situations requiring strong adhesives or coatings.

D. Exposure

Glycidol and its esters and ethers are produced within "closed systems" (Refs. 8 and 9); however, EPA believes that some worker exposure may occur during these production processes, due to intermittent higher-level exposures during maintenance operations, or resulting from spills or leaks from the "closed systems." Similar worker exposure to glycidol may occur during its primary use as a stabilizer in the manufacture of vinyl polymers in "closed systems."

Substantial numbers of workers are or may be exposed by the dermal and inhalation routes to glycidyl derivatives during the processing of glycidyl ethers and esters for various uses, particularly since these processes are generally conducted in open systems (Ref. 8). The National Institute for Occupational Safety and Health (NIOSH) has estimated the numbers of workers potentially exposed to glycidol and some of its derivatives, and these estimates are presented in an exposure support document for this proposed rule (Ref. 8). NIOSH has estimated that 36,697 workers in the United States are potentially exposed to glycidol, that 52,838 workers may be exposed to glycidyl ethers, and that 42,469 workers

may be exposed to glycidyl esters, based on the two esters for which estimates were made (glycidyl methacrylate and glycidyl oleate). Earlier, NIOSH estimated that approximately 118,000 workers in the United States are potentially exposed to glycidyl ethers (Ref. 10). New interest in the use of pure enantiomers of glycidol and substituted glycidyls and their esters for the preparation of optically pure drugs and pheromones (Ref. 11) may lead to an increase in the number of workers exposed to members of this chemical category during production and processing of glycidol and its derivatives.

In comments on the ANPR, a few manufacturers provided data on the number of workers they believed to be exposed during their production operations. In addition, several industrial hygiene surveys, submitted by industry pursuant to TSCA section 8(d) or (e), or published in the open scientific literature, were evaluated by EPA (Ref. 2). EPA has carefully considered this information, but has concluded that the NIOSH estimates provide a more accurate prediction of potential worker exposures for the following reasons: For substances having more than one manufacturer in the United States, not all manufacturers supplied worker-exposure data. Even for substances having only one manufacturer in the United States, the worker-exposure data provided for production did not include the exposure of workers during processing operations (not considered in the manufacturers' surveys) using the substance produced by the reporting manufacturer or the same substance imported from other sources, and data were not submitted for all of the substances in this chemical category which EPA believes to be currently produced domestically or imported.

Occupational exposure to certain glycidyls has occurred for some time. Standards recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) and NIOSH for limiting atmospheric workplace contamination by glycidyls are listed in an exposure support document (Ref. 8). The current standards for glycidyls issued by the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) are listed at 29 CFR 1910.1000. These standards are intended to protect workers from skin irritation and sensitization, as well as other systemic effects, but are based only on reported dermal effects in humans and the results of a limited number of laboratory animal studies for a limited number of health effects.

With respect to commercial and consumer exposure to these substances, EPA does not expect substantial exposure to glycidol itself, but anticipates substantial dermal and/or inhalation exposure to glycidyl ethers and esters due primarily to the commercial and consumer uses of epoxy resin products, especially the two-part resin systems. Based on the comments on the ANPR by Marubeni America Corporation, glycidyl methacrylate (CAS No. 106-91-2) could occur as a residual byproduct in latex and acrylic paints because of the way these products are produced. These paints have widespread consumer use, leading to potential consumer exposure to glycidyl methacrylate. Although the company claims that no residual free monomeric glycidyl methacrylate remains in these paints prior to consumer use, no data were supplied to support this claim. Thus, consumers may be exposed to this substance by use of acrylic and latex paints. Other members of this chemical category also have solvent and other uses that may lead to consumer exposure (Ref. 2). Recent estimates suggest that up to 3 million people in the United States may be exposed dermally or by inhalation to glycidyl ethers through the consumer and commercial use of epoxy resins (Ref. 9). In terms of milligrams (mg) of total glycidyl ethers per year per individual, consumers are estimated to be exposed to 7.1 to 71 mg/yr per individual by inhalation and 104 to 1,040 mg/yr per individual by dermal contact, while individuals using epoxy resins commercially are estimated to be exposed to 140,000 to 1,400,000 mg/yr per individual by inhalation and 150,000 to 1,500,000 mg/yr per individual by dermal contact.

Because bisphenol A diglycidyl ether (CAS No. 1675-54-3), bisphenol F diglycidyl ether (CAS No. 54208-63-8), and various dimers and trimers of these substances have been detected in British drinking waters derived from lowland river water and groundwater in water systems whose mains had been relined with epoxy resin (Ref. 12), it is possible that large numbers of people in the United States may be exposed via drinking water to parts-per-billion (ppb) levels of these or other derivatives of glycidol under similar conditions. EPA's Office of Drinking Water has confirmed that several materials which are accepted for use in drinking water systems in the United States as protective paints and coatings, or as concrete admixtures for increasing durability, do contain glycidyls that may leach into drinking water. However, no monitoring data are available on the presence or absence of these substances in United States drinking water.

E. Environmental Release

Little information is available regarding the environmental releases of glycidyls (Ref. 2). Few environmental releases are expected during the production of glycidol or its esters and ethers, since production occurs in essentially "closed systems" (Refs. 8 and 9). However, during processing operations and use, glycidyls will be released by volatilization and in process waste water. Some of these substances may also be released unchanged in the effluent from industrial waste water treatment plants, although no monitoring data are available. Leaching of glycidyls from cured epoxy resins is expected to be minimal (Ref. 2), although as discussed in Unit II.D. of this preamble, this process may lead to limited exposure levels in drinking water.

F. Health Effects

Because of the number of substances in this chemical category and the total number of health effects studies evaluated for these substances, it is infeasible to present EPA's evaluation of each study in the preamble to this proposed rule. For that reason, a support document (Ref. 3) discussing only health effects studies EPA believes to be pertinent to making findings under section 4(a)(1)(A) of TSCA has been prepared and placed in the rulemaking record. EPA's evaluation of studies not discussed in this support document (Ref. 3) may be found in the technical support document (Ref. 2). A summary of data that support findings for this rule is in Table 1 of Unit IV. of this preamble.

Many of the studies submitted to EPA pursuant to section 8(d) of TSCA, as well as some studies published in the open scientific literature, were deficient because the test substance was not adequately described. For example, the purity of the test substance, the identity of major impurities present, the degree of polymerization, and the average molecular weight were not given. In such cases, EPA did not evaluate the studies in depth. Furthermore, EPA did not evaluate studies submitted for polymeric resins, since EPA believes that any adverse health effects shown by these high-molecular-weight substances will be due primarily to residual low-molecular-weight reactants. Because the low-molecular-weight members of this chemical category are expected to be the most toxic, EPA is proposing that the testing

for the glycidyls chemical category be performed with monomeric substances.

Evaluations of mutagenicity and oncogenicity studies appear in the support document (Ref. 3) by subcategories, as defined in Unit III.C.1. of this preamble. Other health effects studies are discussed in the support document (Ref. 3) on a chemical-specific basis. This approach is used because, in addition to proposing testing of substances triggered by production volume, EPA proposes to require mutagenicity and oncogenicity testing of one representative member of a subcategory if data for a member of a subcategory indicate a concern for these effects. (For oncogenicity testing, annual aggregate subcategory production volume must also exceed 10 million pounds.). For other health effects testing, EPA proposes to require testing of individual substances when preliminary data on a specific substance indicates a concern for a particular health effect.

III. Regulatory Approach Used in this Test Rule

To ensure that adequate data are developed for this category, while avoiding overly burdensome testing, EPA has taken the following approach in developing the proposed test rule for this large chemical category.

A. Substances to Which the Rule Would Apply

There are 66 substances listed on the public portion of the TSCA Chemical Substance Inventory, and there may be some substances listed on the confidential portion of the Inventory, which fall within the glycidyls definition. In this rule, EPA is proposing findings for the category of glycidyls, including glycidol and all 21 subcategories of its derivatives. Also, EPA proposes to include any substance meeting the category definition that is entered into the public or confidential portion of the TSCA Inventory of Chemical Substances after completion of the TSCA premanufacture review process under section 5 of TSCA. EPA has constructed this proposed test rule such that it would require immediate testing only for glycidyls for which EPA has received reports pursuant to the Inventory Update Rule (40 CFR 710.23) or for which EPA has obtained other data indicating current production. Using these criteria, EPA believes that only 32 of the 66 chemical substances in this chemical category and listed on the public portion of the TSCA Chemical Substances Inventory are in current production. These 32 substances have been identified in the subcategorization scheme proposed for the chemical category in Unit III.C.1. of this preamble.

B. Types of Testing Required for Substances Triggered by Production Volume

For the purposes of this rule only, for subcategories having aggregate annual production volumes equal to or greater than 1 million pounds but less than 10 million pounds, EPA proposes the following tests for representative subcategory members: Oral subchronic (90-day) toxicity in the rat; the Chernoff screening test for developmental toxicity in the rat; limited testing for mutagenicity, including the Ames gene mutation test, the mouse lymphoma L5/178Y TK ± gene mutation test, the *in vitro* cytogenetics test using Chinese hamster ovary cells, and the *in vivo* cytogenetics test in the mouse; and oral subchronic (90-day) neurotoxicity testing in the rat, including the functional observation battery, the motor activity test, and neuropathology. EPA is proposing that a representative member from each of the following subcategories, which EPA believes currently meet the production criterion, be tested in this manner: I-A; I-C; II-A; III-A; IV-A; V-B; VII-A; and VII-B (see Unit III.C.1. of this preamble for subcategory definitions). Should the results from these proposed tests so indicate, EPA may propose further testing for substances contained in these subcategories.

For the purposes of this rule only, as soon as a subcategory reaches an aggregate annual production volume of 10 million pounds or more (even if testing described for subcategories having annual aggregate production volumes equal to or greater than 1 million but less than 10 million pounds has been previously conducted), EPA is proposing the following tests for a representative subcategory member: Oral oncogenicity bioassays in rats and mice; oral subchronic (90-day) toxicity studies in rats and mice; oral developmental toxicity tests in rats and mice; oral two-generation reproductive toxicity testing in rats; oral neurotoxicity testing in rats, including acute and subchronic (90-day) functional observation batteries, acute and subchronic (90-day) motor activity tests, and subchronic (90-day) neuropathology; and complete test batteries for gene mutation and chromosomal aberration beginning with the first assay in each test battery for which data are inadequate. EPA is proposing that a representative member of Subcategory VI-A, the only subcategory which EPA believes currently has an aggregate annual production volume of greater than 10 million pounds, be tested in this manner.

C. Use of Structure-Activity Relationships (SAR) and Subcategories

In this proposed rule, EPA has used SAR: (1) To divide the glycidyls category into subcategories for which it is appropriate to require, for oncogenicity and mutagenicity, testing of one substance representing its subcategory as sufficient testing for the subcategory; and (2) to select the representative test substance.

EPA has used SAR in the following ways:

1. *Defining subcategories.* EPA used SAR principles to divide the 66 category members listed on the public portion of the TSCA Chemical Substance Inventory into glycidol and 21 subcategories of its derivatives. EPA's proposed subcategorization scheme is a refinement of the one presented in the ANPR. The SAR bases for the scheme appear in the document, "Subcategorization Scheme for Glycidol Ethers and Esters" (Ref. 13), placed in the record for this rulemaking. The scheme itself is as follows:

SUBCATEGORIZATION SCHEME FOR GLYCIDOL AND ITS DERIVATIVES

Sub-category	Description of R or chemical name	CAS No.
None	Glycidol (R = H atom)	[1] 556-52-5
I	R = alkyl group with <11 carbons:	
I-A	Unsubstituted saturated alkyl:	
	Methyl glycidyl ether	930-37-0
	n-Butyl glycidyl ether	[1] 2426-08-6
	Ethyl glycidyl ether	4016-11-9
	Isopropyl glycidyl ether	4016-14-2

SUBCATEGORIZATION SCHEME FOR GLYCIDOL AND ITS DERIVATIVES—Continued

Sub-category	Description of R or chemical name	CAS No.
	tert-Butyl glycidyl ether	[1] 7665-72-7
	1,3-Dimethylbutyl glycidyl ether	68134-06-5
	6-Methylheptyl glycidyl ether	68134-07-6
	Alkyl (C_8-C_{10}) glycidyl ether	[1] 68609-96-1
	Alkyl (C_8-C_{12}) glycidyl ether	68987-80-4
I-B	Halogenated saturated alkyl containing no additional epoxide substituent:	
	1,2-Dibromopropyl glycidyl ether	35243-69-1
I-C	Unsaturated alkyl containing no halogen or additional epoxide substituents:	
	Allyl glycidyl ether	[1] 106-92-3
I-D	2-Ethylhexyl group:	
	2-Ethylhexyl glycidyl ether	[1] 2461-15-6
II	**R = alkyl group with ≧11 carbons:**	
II-A	Unsubstituted saturated alkyl:	
	Lauryl glycidyl ether	[1] 2461-18-9
	Hexadecyl glycidyl ether	15965-99-8
	n-Octadecyl glycidyl ether	16245-97-9
	Tetradecyl glycidyl ether	38954-75-5
	Alkyl (C_{16}-C_{18}) glycidyl ether	[1] 68081-84-5
	Alkyl (C_{12}-C_{14}) glycidyl ether	[1] 68609-97-2
II-B	Unsaturated alkyl containing no halogen or additional epoxide substituents:	
	Oleyl glycidyl ether	60501-41-9
III	**R = silicon-containing alkyl group:**	
III-A	Saturated alkyl group with no halogen or additional epoxide substituents:	
	3-(Trimethoxysilyl)propyl glycidyl ether	[1] 2530-83-8
	3-(Methyl diethoxysilyl)propyl glycidyl ether	2897-60-1
	3-[Bis(trimethylsiloxy)methyl]propyl glycidyl ether	7422-52-8
	3-(Dimethylethoxysilyl)propyl glycidyl ether	17963-04-1
III-B	Halogenated, saturated alkyl group with no additional epoxide substituent:	
	(3-Chloropropyl)dimethoxy-[3-(oxiranylmethoxy)propyl] silane	71808-64-5
III-C	Non-halogenated, saturated alkyl group with an additional epoxide substituent:	
	1,3-Bis[3-(2,3-epoxypropoxy)propyl]tetramethyldisiloxane	126-80-7
	1,1,1,3,5,7,7,7-Octamethyl-3,5-bis(6,7-epoxy-4-oxaheptyl)tetrasiloxane	69155-42-6
IV	**R = aryl group:**	
IV-A	Aryl group with no halogen, or additional epoxide substituents:	
	Phenyl glycidyl ether	[1] 122-60-1
	o-Cresyl glycidyl ether	[1] 2210-79-9
	p-tert-Butylphenyl glycidyl ether	[1] 3101-60-8
	p-Nonylphenyl glycidyl ether	6178-32-1
	Cresyl glycidyl ether (mixed isomers)	26447-14-3
	p-Cumylphenyl glycidyl ether	61578-04-9
IV-B	Nitroaryl group containing no halogen or additional epoxide substituents:	
	p-Nitrophenyl glycidyl ether	5255-75-4
IV-C	Halogenated aryl group containing no nitro or additional epoxide substituents:	
	2,4-Dibromophenyl glycidyl ether	20217-01-0
	2,6-Dibromo-4-methylphenyl glycidyl ether	22421-59-6
	2,4-Dibromo-6-methylphenyl glycidyl ether	75150-13-9
V	**R = epoxy-substituted alkyl group:**	
V-A	Epoxy-substituted saturated alkyl group with no halogen substituent:	
	Ethylene glycol diglycidyl ether	2224-15-9
	Diglycidyl ether	[1] 2238-07-5
	1,4-Butanediol diglycidyl ether	[1] 2425-79-8
	Glycerol 1,3-diglycidyl ether	3568-29-4
	Glycerol triglycidyl ether	13236-02-7
	1,4-Bis(glycidyloxymethyl)cyclohexane	[1] 14228-73-0
	Neopentyl glycol diglycidyl ether	[1] 17557-23-2
	3-(2-Glycidyloxypropyl)-1-glycidyl-5,5-dimethylhydantoin	32568-89-1
	1,3-Bis(5,5-dimethyl-1-glycidylhydantoin-3-yl)-2-glycidyloxypropane	38304-52-8
	1,2,6-Hexanetriol triglycidyl ether	68959-23-9
V-B	Unsaturated epoxide-substituted alkyl group:	
	1,2,3-Propanetriyl ester of 12-(oxiranylmethoxy)-9-octadecanoic acid	[1] 74398-71-3
VI	**R = aryl group with additional epoxide and/or aryl group substituent(s):**	
VI-A	R contains two or more non-halogenated aryl groups with one or more additional epoxide substituents; not more than one epoxide substituent per aryl group:	
	Bisphenol A diglycidyl ether	[1] 1675-54-3
	2-Methylol-4,4'-isopropylidenediphenol diglycidyl ether	[1] 3188-83-8
	1,1,2,2-Tetra(*p*-hydroxyphenyl)ethane tetraglycidyl ether	[1] 7328-97-4
	Bisphenol F diglycidyl ether	[1] 54208-63-8
	[Bis(4-glycidyloxyphenyl)]-(2-glycidyloxyphenyl)methane	[1] 67786-03-2

SUBCATEGORIZATION SCHEME FOR GLYCIDOL AND ITS DERIVATIVES—Continued

Sub-category	Description of R or chemical name	CAS No.
	1,1,1-Tris(4-hydroxyphenyl)propane triglycidyl ether	[1] 68517-02-2
	2,2-Bis[*p*-2-glycidyloxy-3-butoxypropyloxy)phenyl]propane	71033-08-4
	2,2'-[(1-Methylethylidene)bis[4,1-phenyleneoxy-3,1-propanediyloxy-4,1-phenyleneoxymethylene]]bis (oxirane)	72319-24-5
VI-B	R contains two or more halogenated aryl groups with one or more additional epoxide substitutents; not more than one epoxide substituent per aryl group:	
	2,2',6,6'-Tetrabromobisphenol A diglycidyl ether	3072-84-2
VI-C	Single aryl group with one or more additional epoxide substituent(s):	
	Resorcinol diglycidyl ether	[1] 101-90-6
	Hydroquinone diglycidyl ether	2425-01-6
	4-(Diglycidylamino)phenyl glycidyl ether	[1] 5026-7441
	2,6-Diglycidylphenyl glycidyl ether	13561-08-5
VII	R = acyl group:	
VII-A	Saturated aliphatic acyl group containing no additional epoxide substituent:	
	Glycidyl ester of neodecanoic acid	[1] 26761-45-5
VII-B	*alpha, beta*-Unsaturated aliphatic acyl group containing no additional epoxide substituent:	
	Glycidyl acrylate	[1] 106-90-1
	Glycidyl methacrylate	[1] 106-91-2
VII-C	Saturated aliphatic acyl group containing at least one additional epoxide substituent:	
	Diglycidyl ester of hexahydrophthalic acid	[1] 5493-45-8
VII-D	Aromatic acyl group containing at least one additional epoxide substituent:	
	Diglycidyl ester of phthalic acid	[1] 7195-45-1

[1] Believed by EPA to be in current production or importation, due to EPA's receipt of a report pursuant to the Inventory Update Rule (40 CFR 170.23), or due to Confidential Business Information obtained by EPA.

2. *Determining that requiring oncogenicity and mutagenicity testing of only one substance within a subcategory is appropriate.* As discussed in Unit III.F. of this preamble, EPA interprets TSCA section 4(a) to provide that, once EPA finds that a substance or a category of substances may present an unreasonable risk of injury to health or the environment, it may require the substance or each substance in the category to be tested for all health or environmental effects for which data are inadequate. Under this proposed rule, however, as a matter of testing policy to make testing less burdensome, EPA has selected a different approach. For mutagenicity and oncogenicity, EPA is proposing to require testing of one representative substance within the subcategory.

EPA believes that, for the purposes of this rule, extensive data bases that convincingly correlate chemical structure with observed health effects exist only for mutagenicity and oncogenicity. Therefore, EPA intends to regard the oncogenicity and mutagenicity data obtained for one representative member of a subcategory as sufficient to predict the mutagenic and oncogenic effects of all other members of that subcategory. Thus, if the data obtained from oncogenicity or mutagenicity testing of one representative member of a subcategory indicate a hazard to health, then EPA would regard all other members of that same subcategory as posing the same hazard as the tested substance. EPA has not selected this approach for other health effects at this point in time because EPA has found the existing data bases relating structure and observed effects for other health effects less complete than those for oncogenicity and mutagenicity. As these databases increase, however, EPA may elect to use this SAR approach for other health effects.

3. *Selecting representative members of subcategories for testing.* EPA proposes to consider the following factors in the selection of a representative test substance: (a) Annual production volume; (b) exposure information; (c) test data on the substance itself; and (d) test data on close structural analogues. Although this proposed rule does not generally make explicit which substance would be selected as a test substance, using the above factors, EPA would make the selection and identify the representative test substance in the notification specified in Unit III.G. of this preamble. However, because the finding is proposed for the entire category and the proposed testing is triggered on a subcategory basis, all manufacturers and processors of substances within the subcategory would be legally subject to the rule and responsible for the required testing. For testing triggered by the annual production volume of the subcategory for health effects other than oncogenicity and mutagenicity, EPA proposes, as a matter of policy, to select the member of the subcategory having the highest annual production volume, because EPA expects that glycidyls produced in greater quantities have greater exposure potential. EPA's selection of representative chemicals for testing in this proposal (see Table 5 in Unit V. of this preamble) reflects the application of this approach.

D. Proposed Criteria for Determining Oncogenic Potential of a Subcategory

EPA bases its concern for oncogenicity potential on the aggregate toxicological data available for all members of a given subcategory. A judgement that substances in a subcategory may have oncogenic potential would be made if, for one or more members of the given subcategory, the following types of oncogenicity or mutagenicity data exist:

(1) Positive or suggestive oncogenicity data on a subcategory member which are inadequate for risk assessment purposes.

(2) Positive or suggestive mutagenicity test data on subcategory members which, when considered in the aggregate on a weight-of-the-evidence basis, indicate a need for oncogenicity testing.

(3) Positive or suggestive oncogenicity or mutagenicity data on a close structural analogue of a subcategory member.

E. Proposed Criteria for Determining Mutagenic Potential of a Subcategory

EPA bases its concern for mutagenic potential on the aggregate toxicological data available for all members of a given subcategory. A judgement that substances in a subcategory have specific mutagenic potential is proposed if, for one or more members of a given subcategory, the following types of mutagenicity or oncogenicity data exist:

(1) Mutagenicity data on subcategory members which, when considered in the aggregate on a weight-of-evidence basis indicate a need for further mutagenicity testing.

(2) Positive or suggestive oncogenicity data on a subcategory member.

(3) Positive or suggestive oncogenicity or mutagenicity data on a close structural analogue of a subcategory member.

Consideration of oncogenicity data on subcategory members and close structural analogues as a basis for requiring mutagenicity testing is based upon the well-established fact that many chemical substances exhibiting oncogenic activity also elicit mutagenic activity.

F. Types of Testing Required for Substances Based on Preliminary Hazard Data

TSCA section 4(a) gives EPA the authority to require that testing be conducted, once EPA has made the requisite findings under section 4(a)(1)(A) or (B), to develop data with respect to the health and environmental effects for which there is an isufficiency of data and experience and which are relevant to a determination that the manufacture, distribution in commerce, processing, use, or disposal of such substance or mixture, or that any combination of such activities, does or does not present an unreasonable risk of injury to human health or the environment. Thus, EPA can require any or all testing necessary to determine the health or environmental effects for which EPA has determined there is an insufficiency of data or experience. There is no connection in TSCA between the "may present unreasonable risk" finding in TSCA section 4(a)(1)(A)(i) and the choice of tests to be conducted. Rather, the statute clearly relates the required testing to the data and experience which EPA has found to be insufficient to determine or predict the health or environmental effects.

Accordingly, the choice of appropriate tests in a test rule depends on EPA's judgement about the insufficiency of data and experience under TSCA section 4(a)(1)(A)(ii) or (B)(ii) and EPA's determination whether the testing is "relevant to" an unreasonable risk determination. Thus, EPA may choose to require testing for a specific effect, even in the absence of information suggesting that the substance in question may cause the effect, if EPA determines that the test results would be relevant to an unreasonable risk determination for the activities involving that substance.

For the purposes of this rule, however, when EPA requires testing under TSCA section 4(a)(1)(A), as a matter of testing policy, and to reduce cost and burden, EPA is proposing to require health effects testing only for effects (or closely related effects) that are related to preliminary data suggesting adverse health effects on the particular substance (or, in the case of mutagenicity and oncogenicity, that are related to such preliminary data on members of the particular subcategory).

G. TSCA Section 8(a) Reporting and Triggering of Testing

EPA intends to trigger some testing based only upon certain production levels being reached.

Under the authority of section 8(a) of TSCA, EPA is proposing that manufacturers (and importers) must provide annual reporting of the production and/or importation volumes for all of the substances meeting the definition of this chemical category which are currently or become listed on the public or confidential portion of the TSCA Chemical Substances Inventory. Using these data, EPA proposes to determine the annual aggregate production volumes for glycidol and the subcategories of its derivatives. Where the aggregate annual production volume of glycidol or a given subcategory reaches or exceeds 1 million pounds, or, subsequently, 10 million pounds, EPA proposes that it notify by certified letter or Federal Register notice all manufacturers, importers, and processors of glycidol or substances within that subcategory that the appropriate testing then required for that subcategory, described in Unit III.B. of this preamble, must be initiated with representative substances. EPA proposes to select the representative substances from subcategories as outlined in Unit III.C.3. of this preamble.

IV. Findings

EPA is basing its proposed testing for members of the chemical category of glycidyls on the authority of sections 4(a)(1)(A) and 4(a)(1)(B) of TSCA through the use of TSCA section 26(c). Either finding is alone sufficient to support a test rule. Under TSCA section 26(c), EPA proposes to make section 4(a)(1)(A) and section 4(a)(1)(B) findings for the entire category of substances designated as glycidyls, encompassing the 66 discrete chemicals included on the TSCA public portion of the inventory, and any substance that is on the confidential portion of the inventory that would be included in the category, and any substance not yet produced that would fit the definition. This finding includes all monomeric glycidyls, including those which exist as monomeric byproducts of glycidyl polymer manufacture. EPA believes that this is an appropriate category of substances under section 26(c) because they are similar in molecular structure and in use (and are in many instances used interchangeably), and because their common epoxide functionality confers the potential for biological activity. This category is also "suitable for classification" because the ITC designated the category of glycidol and its derivatives for priority consideration for testing.

A. Findings Under TSCA Section 4(a)(1)(A)(i)

Pursuant to section 4(a)(1)(A)(i) of TSCA, EPA finds that the manufacturing, processing, use, distribution in commerce, and disposal of all substances comprising the chemical category of "glycidyls", as defined in the sample regulatory text in this preamble, may present an unreasonable risk of injury to human health. The finding that this category of substances may present an unreasonable risk is based on their hazard potentials and potential exposures to the substances.

Many members of the glycidyls category are known to elicit adverse health effects. A support document (Ref. 3) discusses available toxicological data demonstrating that glycidyls are known to elicit the following adverse health effects: Oncogenicity, mutagenicity, developmental toxicity, adverse reproductive effects, subchronic toxicity, and chronic toxicity. The specific hazard data that support EPA's finding for the category are listed in the following Table 1:

TABLE 1.—DATA SUPPORTING THE TSCA SECTION 4(A)(1)(A) FINDINGS FOR GLYCIDYLS

Subcategory[1] or Substance	Type of Adverse Effects	Reference 3 section(s) supporting TSCA section 4(a)(1)(A)(i) findings
Glycidol (CAS No. 556-52-5)[2]	Oncogencity	Addendum to II.1.a.
	Mutagenicity	II.1.a. and II.2
	Reproductive toxicity	II.4.a.
	Neurotoxicity	II.5.a.
Subcategory I-A	Oncogenicity	II.2.b.
	Mutagenicity	II.2.b.
Subcategory I-C	Mutagenicity	II.2.c.
Subcategory I-D	Oncogenicity	II.1.c.
	Mutagenicity	II.1.e.
Subcategory II-A	Mutagenicity	II.2.e.
Subcategory III-A	Oncogenicity	II.2.f.
	Mutagenicity	II.2.f.
Subcategory IV-A	Mutagenicity	II.1.d. and II.2.g.
Subcategory V-A	Oncogenicity	II.1.e. and II.2.i.
	Mutagenicity	II.1.e. and II.2.i.
Subcategory VI-A	Oncogenicity	II.1.f. and II.2.j.
	Mutagenicity	II.1.f. and II.2.j.
Subcategory VI-C	Mutagenicity	II.1.g. and II.2.k.
Subcategory VII-B	Oncogenicity	II.1.h. and II.2.m.
	Mutagenicity	II.1.h. and II.2.m.
Subcategory VII-C	Oncogenicity	II.2.n.
	Mutagenicity	II.2.n.
Bisphenol A diglycidyl ether (CAS No. 1675-54-3)	Developmental toxicity	II.3.d.
	Reproductive toxicity	II.4.g.
	Subchronic toxicity	II.6.k. and II.7.e.[3]
n-butyl glycidyl ether (CAS No. 2426-08-6)	Reproductive toxicity	II.4.c.
	Neurotoxicity	II.5.b.
	Subchronic toxicity	II.6.d.
Alkyl (C_8-C_{10}) glycidyl ether (CAS No. 68609-96-1)	Reproductive toxicity	II.4.d.
	Subchronic toxicity	II.6.e.
Allyl glycidyl ether (CAS No. 106-92-3)	Reproductive toxicity	II.4.e.
	Neurotoxicity	II.5.c.
3-(Trimethoxysilyl)propyl glycidyl ether (CAS No. 2530-83-8)	Reproductive toxicity	II.4.h.
	Neurotoxicity	II.5.f.
	Subchronic	II.6.g.
Phenyl glycidyl ether (CAS No. 122-60-1)	Reproductive toxicity	II.4.b.
	Neurotoxicity	II.5.g.
o-Cresyl glycidyl ether (CAS No. 2210-79-9)	Neurotoxicity	II.5.h.
1,4-Butanediol diglycidyl ether (CAS No. 2425-79-8)	Neurotoxicity	II.5.i.
	Subchronic toxicity	II.6.j.
Alkyl (C_{12}-C_{14}) glycidyl ether (CAS No. 68081-84-5)	Subchronic toxicity	II.6.f.
Glycidyl ester of neodecanoic acid (CAS No. 26761-45-5)	Subchronic toxicity	II.6.m.
Glycidyl methacrylate (CAS No. 106-91-2)	Subchronic toxicity	II.6.n. and II.7.g[3]
Neopentyl glycol diglycidyl ether (CAS No. 17557-3-2)	Subchronic toxicity	II.7.f.[3]

[1] Listed subcategories are defined in Unit III.B.1. of this preamble.
[2] Number contained in parentheses represents the Chemical Abstracts Service (CAS) registry number.
[3] Although flawed chronic data support the findings for this testing, because EPA believes that a well-conducted 90-day subchronic toxicity study is capable of detecting those effects (except for oncogenicity and certain other effects requiring long latency periods) which would be observed in a chronic toxicity study, EPA generally requires subchronic toxicity testing.

Many or all of these effects might be the result of the well-established alkylating potential of the glycidyl moiety shared by all members of the glycidyls category, indicating that all members of the glycidyls category may pose a hazard to health.

The exposure component of this finding is described in Unit II.D. of this preamble and in two exposure support documents (Refs. 8 and 9). Briefly, these

data indicate that: (1) 36,697 workers are potentially exposed to glycidol; (2) 52,838 workers may be exposed to glycidyl ethers; (3) 42,469 workers may be exposed to glycidyl esters; and (4) 3 million people may be exposed to glycidyl ethers through the combined consumer and commercial use of epoxy resins.

Pursuant to section 4(a)(1)(A)(ii) and (iii) of TSCA, EPA finds that, for all substances comprising the glycidyls category, data are insufficient (for the reasons specified in Ref. 3) to determine or predict the effects of manufacturing, processing, distribution in commerce, or use of these substances on health, and that testing of these substances or appropriate representative substances is necessary to determine or predict their effects.

B. Findings Under TSCA Section 4(a)(1)(B)(i)

1. *Findings.* Pursuant to TSCA section 4(a)(1)(B)(i), EPA finds that the category of "glycidol and its derivatives" is or will be produced in substantial quantities. Specifically, EPA finds that 24 million pounds per year of these monomeric glycidyls are produced, excluding byproducts of glycidyl polymer manufacture.

The recent (usually data for 1985) aggregate annual production volumes for glycidol (CAS No. 556-52-5) and for each of the 21 subcategories of derivatives were determined by using data (Ref. 6) from reports submitted pursuant to the Inventory Update Rule (40 CFR 710.23) and from confidential current production information obtained by EPA. EPA recognizes that there are certain limitations in using the Inventory Update Reports for the purposes of this rulemaking (see 40 CFR 710.23 for details); however, EPA believes these data to be the most accurate figures currently available. As some of the 21 subcategories of glycidol derivatives contain only one chemical substance and, in some cases, all of the relevant production volume data for single-substance subcategories are confidential, all of the aggregate annual production volume data for glycidol and the 21 subcategories of its derivatives are being treated as TSCA Confidential Business Information (CBI). For the purposes of this rulemaking, EPA proposes to regard aggregate annual production volumes equal to or greater than 1 million pounds as a valid basis for making a finding of substantial production under TSCA section 4(a)(1)(B) for the reasons set forth in EPA's proposed TSCA section 4 policy proposed in the Federal Register on July 15, 1991 (56 FR 32294).

Further, pursuant to TSCA section 4(a)(1)(B)(i), EPA finds that there may be substantial exposure to the entire chemical category of glycidol and its derivatives from their manufacturing, processing, disposal, distribution in commerce, and use. Specifically, EPA finds that 24 million pounds per year of these monomeric glycidyls are produced (excluding byproduct manufacture; Ref. 6), that 36,697 workers may be exposed to glycidol, 52,838 workers may be exposed to monomeric glycidyl ethers, and 42,469 workers may be exposed to glycidyl esters each year (Ref. 8), that 3 million people may be exposed to glycidyl ethers through consumer and commercial use of epoxy resins (Ref. 9), and that the number of workers and/or consumers who may be exposed to glycidol and its derivatives is substantial under section 4(a)(1)(B). For the reasons discussed in the Federal Register notice explaining EPA's interpretation of its legal authority to require testing under TSCA section 4(a)(1)(B) (56 FR 32294, July 15, 1991), potential exposure to 1,000 workers and/or 10,000 consumers is considered to be potential substantial human exposure under TSCA section 4(a)(1)(B).

Alternatively, EPA proposes to make the section 4(A)(1)(B)(i) findings of substantial production and potential substantial human exposure for the entire category of glycidyls, limiting the category to the monomeric glycidyls, but including by-product glycidyl monomers present in various epoxy resins. On the basis of preliminary but convincing evidence (Ref. 7), EPA finds that over 343 million pounds of monomeric glycidyls are produced each year, when glycidyls present in resins are included in the total, and that this amount in this case is substantial under section 4(a)(1)(B) of TSCA. Also, EPA finds that 132,000 workers (Ref. 8) and 3 million consumers (Ref. 9) may be exposed to these monomeric glycidyls and that this number in this case is substantial under TSCA section 4(a)(1)(B). These amounts are substantial for the reasons set forth in the Federal Register notice explaining EPA's interpretation of its authority under TSCA section 4(a)(1)(B) (56 FR 32294, July 15, 1991).

In the notice articulating EPA's proposed criteria for interpreting its legal authority under TSCA section 4(a)(1)(B), EPA stated that it would continue to refine the criteria in specific rules. EPA believes that, for this category of chemical substances in which certain subcategory members are structurally similar, may be used interchangeably, and in which some individual members of the category are produced in substantial quantities, it may be reasonable to require testing of subcategories of chemicals that collectively are or will be produced in quantities over 1 million pounds per year, and that either may be released to the environment in amounts greater than 1 million pounds per year or for which there may be exposure to over 1,000 workers, 10,000 consumers or 100,000 people, because if EPA made findings only on the individual substances that currently meet these thresholds, persons subject to the rule could simply switch to substances not in current production. Thus, EPA would have to propose an additional test rule. Theoretically, the persons subject to the rule could continue switching the substances they make and process, and EPA would never catch up. To inhibit this, EPA believes it is appropriate in this special case to make the findings for the subcategories using the same numerical thresholds as articulated for individual chemical substances and mixtures. However, for other chemical categories EPA may decide not to make the substantial exposure or quantities finding for the category as a whole, instead considering exposure on a subcategory or individual chemical basis.

Pursuant to section 4(a)(1)(B)(ii) and (iii) of TSCA, EPA finds that, for all substances comprising the glycidyls category, data are insufficient (for the reasons specified in Ref. 3) to determine or predict the effects of manufacturing, processing, distribution in commerce, or use of these substances on health, and that testing of these substances is necessary to determine or predict their effects.

For purposes of this rule, persons are invited to comment on how the TSCA section 4(a)(1)(B) criteria proposed in the Federal Register (56 FR 32294, July 15, 1991) apply to the TSCA section 4(a)(1)(B) findings made in this rule. EPA specifically solicits comment on whether EPA should use the same section numerical thresholds required to make a section 4(a)(1)(B) finding for a subcategory of chemicals as the numerical thresholds used for individual chemicals, or instead require higher thresholds for subcategories. When this rule is promulgated, EPA will address all comments on the proposed criteria that are relevant to this rule as well as the comments on this proposed rule.

2. *Choices on testing of substances for which TSCA section 4(a)(1)(B) findings are made—a. Testing batteries.* Once EPA has made the above findings under TSCA section 4(a)(1)(B)(i), EPA may require any health effects testing for

which EPA finds that there are insufficient data and for which testing is necessary to determine whether the substance presents or does not present an unreasonable risk to health. EPA has, however, taken into account the ability of manufacturers to pay for such testing and has decided not to require the entire battery of tests. Instead, EPA is proposing to trigger testing from the production volumes of glycidol and of the members of the various subcategories of glycidyls. Once the production volume of glycidol or a subcategory of glycidyls reaches 1 million pounds per year, a specified battery of tests would be triggered. Once the production volume reaches 10 million pounds per year, a more extensive battery of tests would be triggered. These production volumes are used as a rough measure of the affordability of testing.

b. *Test substance.* Based on the findings made for the entire category, all manufacturers and processors of glycidyls would be subject to this rule, but one substance within a subcategory would be designated as the test substance for the testing required as a result of the section 4(a)(1)(B) finding. Thus, all of the manufacturers and processors of substances within the subcategory would be responsible for the testing costs, although not every member of a subcategory would be tested. The purpose of proceeding this way is twofold. First, it will take into account the affordability of testing. Second, because some of the substances within this category are used interchangeably, it would prevent manufacturers and processors from manipulating production among the various members of a subcategory to avoid paying for testing. Unit III.C.3. of this preamble outlines the method of selecting the proposed test substance within each subcategory.

If at the time subcategory testing is triggered the specified test substance is not commercially available, then for testing for all effects, except mutagenicity and oncogenicity, the highest production substance on the date the subcategory meets the production trigger would be selected by EPA as the test substance for the subcategory testing. EPA will consider available mutagenicity and oncogenicity test data on subcategory members and close structural analogues, as well as production data, in selecting test substances for these two health effects.

V. Proposed Rule

A. Testing Proposed to be Triggered as a Result of Data Submitted Under Section 8(a) of TSCA

EPA is proposing under section 4(a)(1)(B) of TSCA the tests listed in Tables 2 and 3 elsewhere in this preamble for glycidol or for a representative member of each subcategory which meets certain production volume criteria. EPA is proposing the oral route of administration for all whole-animal studies, and specifying gavage administration for the oncogenicity, the subchronic toxicity, the *in vivo* cytogenetics, the developmental toxicity (both standard and screening tests), the reproductive toxicity, the dominant lethal, the heritable translocation, and the MBSL or MVSL tests, as discussed in Unit V.B. of this preamble.

To mitigate testing costs, EPA is proposing to require the testing listed in the following Table 2 for glycidol or for a representative member of any subcategory for which the annual reports, which EPA is proposing under section 8(a) of TSCA, indicate an aggregate annual subcategory production volume of at least 1 million pounds but less than 10 million pounds.

TABLE 2.—PROPOSED TESTS, TEST STANDARDS, AND REPORTING REQUIREMENTS FOR GLYCIDOL OR FOR SUBCATEGORIES HAVING ANNUAL AGGREGATE PRODUCTION/IMPORTATION VOLUMES OF AT LEAST 1 MILLION BUT LESS THAN 10 MILLION POUNDS

Proposed test	Proposed test standard (40 CFR part 798)	Reporting requirements for final report[1]
90-Day oral subchronic toxicity in rats	§ 798.2650	12 months
Chernoff screening test for developmental toxicity in the rat	§ 798.4420	12 months
Ames gene mutation test	§ 798.5265	9 months
Mouse lymphoma L5/178Y TK ± gene mutation test	§ 798.5300	10 months
In vitro cytogenetics test with Chinese hamster ovary cells	§ 798.5375	10 months
In vivo cytogenetics test in the mouse	§ 798.5385	14 months
Oral subchronic (90-day) neurotoxicity testing in rats:		
Functional observation battery	§ 798.6050	18 months
Neuropathology	§ 798.6400	18 months
Motor activity	§ 798.6200	18 months

[1] The numbers of months, calculated from the date of EPA's notification of manufacturers and importers that testing should be initiated, by which a final report must be submitted to EPA. Interim (6-month) progress reports would be required for all tests having final report deadlines of 9 months or greater.

The proposed test standard for each test appears in 40 CFR part 798. EPA is proposing to notify by certified letter or Federal Register notice all manufacturers and importers of glycidol or of all substances contained in a given subcategory whose annual production meets the proposed trigger that testing of a representative substance will be required. At the same time, EPA would provide affected persons a limited time to submit new data not available at the time of this rulemaking showing that some or all of the tests have already been performed. Following review of the new data, and according to the procedures presented in Unit III.C.3. of this preamble, EPA would then notify manufacturers and importers to initiate testing with specific test substances. With respect to mutagenicity testing, all four tests listed in Table 2 are to be conducted, but EPA is not proposing in this rule the triggering of additional testing for either mutagenicity or oncogenicity from these test results. All manufacturers and processors of any substance within the subcategory would be required to pay for the testing.

The proposed reporting requirements would be calculated from the date of notification. Six-month interim progress reports are proposed for all tests of 9 months or more in duration. EPA proposes to identify the representative chemical from the subcategory to be tested, using the criteria in Unit III.C.3. of this preamble. Table 2 lists the proposed tests, test standards, and reporting requirements for glycidol or for subcategories having future annual

aggregate production/importation volumes of at least 1 million but less than 10 million pounds.

For glycidol or for subcategories which, based on TSCA section 8(a) reports, attain an annual aggregate subcategory production (including importation) volume of 10 million pounds or greater, EPA is proposing the specific tests, test standards, and reporting requirements presented in the following Table 3:

TABLE 3.—PROPOSED TESTS, TEST STANDARDS, AND REPORTING REQUIREMENTS FOR GLYCIDOL OR FOR SUBCATEGORIES HAVING FUTURE ANNUAL AGGREGATE PRODUCTION/IMPORTATION VOLUMES OF 10 MILLION POUNDS OR GREATER

Proposed test	Proposed test standard (40 CFR part 798)	Reporting Requirements for final reports[1]
Oral oncogenicity bioassays in rats and mice and associated 90-day oral subchronic studies.	§ 798.3300 and § 798.2650	53 months
Developmental toxicity testing in rats and mice	§ 798.4900	12 months
Two-generation reproductive toxicity testing in rats	§ 798.4700	29 months
Acute oral neurotoxicity testing in rats:		
Functional observation battery	§ 798.6050	6 months
Motor activity studies	§ 798.6200	6 months
Oral subchronic (90-day) neurotoxicity testing in rats:		
Functional observation battery	§ 798.6050,	18 months
Motor activity studies	§ 798.6200	18 months
Neuropathology	§ 798.6400	18 months
Ames gene mutation test	§ 798.5265	9 months
Mouse lymphoma L5/178Y TK ± gene mutation test	§ 798.5300	19 months[2] (10 months)[3]
Sex-linked recessive lethal gene mutation test in Drosophila	§ 798.5275	31 months[2] (12 months)[3]
Mouse visible specific locus gene mutation test or Mouse biochemical specific locus gene mutation test.	§ 798.5200 or § 798.5195	51 months [4] (either test)
In vitro cytogenetics test with Chinese hamster ovary cells	§ 798.5375	10 months
In vivo cytogenetics test in the mouse	§ 798.5385	24 months[2] (14 months)[3]
Dominant lethal cytogenetics test in the mouse	§ 798.5450	36 months[2] (12 months)[3]
Heritable translocation cytogenetics test in the mouse	§ 798.5460	25 months[4]

[1] The number of months, calculated from the date of EPA's notification of manufacturers and importers that testing should be initiated, by which a final report must be submitted to EPA. Interim (6-month) progress report would be required for all tests having final report deadlines of 9 months or greater.

[2] If required due to results of lower-tier testing, the number of months, calculated from the date of EPA's notification of manufacturers and importers that the initial lower-tier testing would be conducted, by which a final report must be submitted to EPA. Interim (6-month) progress reports would be required for all tests having final report deadlines of 9 months or greater.

[3] The number of months allowed for the given test, not including the time allowed for previous mutagenicity testing.

[4] The number of months by which the final report is due to EPA, calculated from the date of EPA's notification of manufacturers and importers that testing must be initiated, based upon EPA's review of all of the available mutagenicity data.

For mutagenicity testing, EPA proposes using the same test sequences and triggering of tests (including oncogenicity bioassay testing) as discussed in Unit V.B.2. of this preamble. EPA proposes to notify all manufacturers and importers of glycidol or of substances contained in such a subcategory that the subcategory production/importation trigger has been reached and that testing of a representative substance will be required. At that time, EPA would provide affected persons a limited time to submit new data not available at the time of this rulemaking showing that some or all of the tests have already been performed. After review of the new data, and according to the procedures presented in Unit III.C.3. of this preamble, EPA would then notify manufacturers and importers that testing should be initiated with specific test substances.

B. Proposed Immediately-Required Testing and Test Standards Based on Available Hazard and/or Production Data

The proposed immediately-required testing and test standards for glycidyls, based on available hazard and/or production data, are summarized in the following Table 4:

TABLE 4.—PROPOSED IMMEDIATELY-REQUIRED TESTING AND TEST STANDARDS FOR GLYCIDYLS (NOT INCLUDING FUTURE TESTING TRIGGERED BY SUBCATEGORY PRODUCTION VOLUME)

Proposed test(s)	Subcategory	Test substance	Required to test[1]	Comments
Oncogenicity:				
1. Oral bioassays in rats and mice (§ 798.3300).				
2. 90-Day oral subchronic toxicity tests in rats and mice (§ 798.2650)..	VI-A	Bisphenol A diglycidyl ether (CAS No. 1675-54-3)	S	

TABLE 4.—PROPOSED IMMEDIATELY-REQUIRED TESTING AND TEST STANDARDS FOR GLYCIDYLS (NOT INCLUDING FUTURE TESTING TRIGGERED BY SUBCATEGORY PRODUCTION VOLUME)—Continued

Proposed test(s)	Subcategory	Test substance	Required to test[1]	Comments
Mutagenicity:[2]				
Tiered tests for gene mutation and chromosomal aberration. (See comments column of the table for entry assay into each tier.) As noted, in some cases only specific tests are required. Representative test substances for subcategories tested based on adverse hazard data or for subcategories having annual aggregate production volumes equal to or greater than 10 million pounds are subject to all triggered mutagenicity testing shown in Charts 1 and 2 in Unit V.B.2. of this preamble for both testing tiers..				
As noted, testing for representative numbers of subcategories having aggregate annual production volumes of 1 million pounds or more, but less than 10 million pounds, currently inlcudes only the four mutagenicity tests listed. Further testing would be required when subcategory production volume reaches or exceeds 10 million pounds..	None	Glycidol (CAS No. 556-52-5)	I	GM: MSL and CA: DL
	I-A	*n*-Butyl glycidyl ether (CAS No. 2426-08-6)	S	GM: SLRL and CA: DL
	I-C	Allyl glycidyl ether (CAS No. 106-92-3)	S*	GM: MSL and CA: DL
	I-D	2-Ethylhexyl glycidyl ether (CAS No. 2461-15-6)	S*	GM: MC and CA: MC
	II-A	Alkyl (C_{12}-C_{14}) glycidyl ether (CAS No. 68609-97-2)	S	GM: Ames, CA: MC and In Vivo, only
	III-A	3-(Trimethoxysilyl)propyl glycidyl ether (CAS No. 2530-83-8)	S*	GM: SLRL and CA: MC
	IV-A	*o*-Cresyl glycidyl ether (CAS No. 2210-79-9)	S	GM: SLRL and CA: None
	V-A	1,4-Butanediol diglycidyl ether (CAS No. 2425-79-8)	S	GM: MSL and CA: DL
	V-B	1,2,3-Propanetriyl ester of 12-(oxiranylmethoxy)-9-octadecenoic acid (CAS No. 74398-71-3)	S*	GM: Ames and MC, only; CA: MC and In Vivo, only
	VI-A	Bisphenol A diglycidyl ether (CAS No. 1675-54-3)	S	GM: MC and CA: DL
	VI-C	4-(Diglycidylamino)phenyl glycidyl ether (CAS No. 5026-74-4)	S	GM: MSL and CA: DL
	VII-A	Glycidyl ester of neodecanoic acid (CAS No. 26761-45-5)	S*	GM: Ames and MC, only; CA: MC and In Vivo, only
	VII-B	Glycidyl acrylate (CAS No. 106-90-1)	S	GM: SLRL and CA: DL
	VII-C	Diglycidyl ester of hexahydrophthalic acid (CAS No. 5493-45-8)	S*	GM: SLRL and CA: DL
Developmental Toxicity:				
See Comments Column of the Table for requirements for full test (§ 798.4900) in rats and mice or the Chernoff screening test (§ 798.4420) in rats..	I-A	*n*-Butyl glycidyl ether (CAS No. 2426-08-6)	S	Screening test.
	I-C	Allyl glycidyl ether (CAS No. 106-92-3)	S*	Screening test.
	II-A	Alkyl (C_{12}-C_{14}) glycidyl ether (CAS No. 68609-97-2)	S	Screening test.
	III-A	3-(Trimethoxysilyl)propyl glycidyl ether (CAS No. 2530-83-8)	S*	Screening test.
	IV-A	*o*-Cresyl glycidyl ether (CAS No. 2210-79-9)	S	Screening test.
	V-B	1,2,3-Propanetriyl ester of 12-(oxiranylmethoxy)-9-octadecenoic acid (CAS No. 74398-71-3)	S*	Screening test.
	VI-A	Bisphenol A diglycidyl ether (CAS No. 1675-54-3)	S	Full test[3]
	VII-A	Glycidyl ester of neodecanoic acid (CAS No. 26761-45-5)	S*	Screening test
	VII-B	Glycidyl methacrylate (CAS No. 106-91-2)	S	Screening test.
Reproductive toxicity:				

TABLE 4.—PROPOSED IMMEDIATELY-REQUIRED TESTING AND TEST STANDARDS FOR GLYCIDYLS (NOT INCLUDING FUTURE TESTING TRIGGERED BY SUBCATEGORY PRODUCTION VOLUME)—Continued

Proposed test(s)	Subcategory	Test substance	Required to test[1]	Comments
Oral two-generation reproduction study (§ 798.4700) in rats..	None	Glycidol (CAS No. 556-52-5)	I	
	I-A	*n*-Butyl glycidyl ether (CAS No. 2426-06-6)	I	
	I-A	Alkyl (C_8-C_{10}) glycidyl ether (CAS No. 68609-96-1)	I	
	I-C	Allyl glycidyl ether (CAS No. 106-92-3)	I	
	III-A	3-(Trimethoxysilyl)propyl glycidyl ether (CAS No. 2530-83-8)	I	
	IV-A	Phenyl glycidyl ether (CAS No. 122-60-1)	I	
	VI-A	Bisphenol A diglycidyl ether (CAS No. 1675-54-3)	S	
Neurotoxicity (in rats):				
1. Acute and Subchronic (§ 798.6050).				
2. Acute and Subchronic (§ 798.6200).				
3. Subchronic (§ 798.6400) See Comments Column of the table for determination if only subchronic tests are required, or if both subchronic and acute tests are required..	None	Glycidol (CAS No. 556-52-5)	I	Subchronic and acute
	I-A	*n*-Butyl glycidyl ether (CAS No. 2426-06-6)	I/S	Subchronic and acute
	I-C	Allyl glycidyl ether (CAS No. 106-92-3)	I/S*	Subchronic and acute
	II-A	Alkyl (C_{12}-C_{14}) glycidyl ether (CAS No. 68609-97-2)	S	Subchronic only
	III-A	3-(Trimethoxysilyl)propyl glycidyl ether (CAS No. 2530-83-8)	I/S*	Subchronic and acute
	IV-A	Phenyl glycidyl ether (CAS No. 122-60-1)	I/S	Subchronic and acute
	IV-A	*o*-Cresyl glycidyl ether (CAS No. 2210-79-9)	I/S	Subchronic and acute
	V-A	1,4-Butanediol diglycidyl ether (CAS No. 2425-79-8)	I	Subchronic and acute
	V-B	1,2,3-Propanetriyl ester of 12-(oxiranylmethoxy)-9-octadecenoic acid (CAS No. 74398-71-3)	S*	Subchronic only
	VI-A	Bisphenol A diglycidyl ether (CAS No. 1675-54-3)	S	Subchronic and acute
	VII-A	Glycidyl ester of neodecanoic acid (CAS No. 26761-45-5)	S*	Subchronic only
	VII-B	Glycidyl methacrylate (CAS No. 106-91-2)	S	Subchronic only
Oral Subchronic (90-Day) Toxicity in rat: (§ 798.2650)	I-A	*n*-Butyl glycidyl ether (CAS No. 2426-06-6)	I	
	I-A	Alkyl (C_8-C_{10}) glycidyl ether (CAS No. 68609-96-1)	I	
	I-A	*tert*-butyl glycidyl ether (CAS No. 7665-72-7)	S	
	I-C	Allyl glycidyl ether (CAS No. 106-92-3)	S*	
	II-A	Alkyl (C_{12}-C_{16}) glycidyl ether (CAS No. 68081-84-5)	I	
	II-A	Alkyl (C_{12}-C_{14}) glycidyl ether (CAS No. 68609-97-2)	S	
	III-A	3-(Trimethoxysilyl)propyl glycidyl ether (CAS No. 2530-83-8)	S*	
	IV-A	*o*-Cresyl glycidyl ether (CAS No. 2210-79-9)	S	
	V-A	1,4-Butanediol diglycidyl ether (CAS No. 2425-79-8)	I	
	V-A	Neopentyl glycol diglycidyl ether (CAS No. 17557-23-2)	I	
	V-B	1,2,3-Propanetriyl ester of 12-(oxiranylmethoxy)-9-octadecenoic acid (CAS No. 74398-71-3)	S*	
	VII-A	Glycidyl ester of neodecanoic acid (CAS No. 26761-45-5)	S*	
	VII-B	Glycidyl methacrylate (CAS No. 106-91-2)	I	
	VII-B	Glycidyl acrylate (CAS No. 106-90-1)	S	

[1] Abbreviations used to indicate persons required to test: S indicates that manufacturers and importers of all substances in the subcategory are required to test. S* indicates that, although all manufacturers and importers of all substances in the subcategory are required to test, the subcategory currently contains only one substance thought to be currently imported or produced. I indicates that manufacturers and importers of the given substance only are required to test. I/S or I/S* indicates that, for neurotoxicity testing only, manufacturers and importers of all substances in the subcategory are required to conduct the subchronic tests, but only the manufacturers and importers of the specific test substances, which are also subject to testing based on preliminary data, are required to conduct the acute tests.

[2] Abbreviations used for mutagenicity testing: GM is gene mutation. CA is chromosomal aberration. MSL is the mouse visible or biochemical specific locus assay. DL is the rodent dominant lethal assay. Ames is the gene mutation test utilizing *Salmonella typhimurium*. MC indicates an *in vitro* assay with mammalian cells. SLRL is the sex-linked recessive lethal assay in *Drosophila melanogaster*. *In Vivo* indicates an assay in an intact mammal.

[3] Due to a valid dermal developmental toxicity study in rabbits, only a complete oral study in rats is required.

This table includes individual substances for which EPA has preliminary adverse hazard data for various health effects, as well as subcategories (and selected representative test substances for which EPA has preliminary adverse mutagenicity or oncogenicity data. This table also includes subcategories (and selected representative test substances) which at this time have reached either of the production volume testing triggers (1 million or 10 million pounds annual aggregate subcategory production volume). In the future, this table will change as various subcategories meet the production volume testing triggers, becoming subject to the testing batteries proposed at each production level.

EPA is proposing that the health effects testing be conducted in accordance with specific guidelines set forth in 40 CFR part 798, modified as to route of administration as discussed below, and enumerated in Table 4 as the test standards. The TSCA health effects testing guidelines specify generally accepted minimal conditions for determining the health effects for substances to which humans are expected to be exposed. EPA is proposing that all whole-animal studies be conducted in rats and mice, because EPA believes that the relevant historical data bases (used for comparative purposes) for these studies are the largest for these two species with respect to glycidyls. Similarly, EPA is proposing specific insect species and mammalian cell lines proposed for the mutagenicity testing because of their large historical data bases. EPA solicits comment on this approach.

1. *Oncogenicity.* As shown in Table 4, EPA is proposing that a representative member of subcategory VI–A, bisphenol A diglycidyl ether, be designated as the test substance for oncogenicity testing in both rats and mice. As discussed in a support document (Ref. 3), EPA has preliminary adverse data for the following subcategories in addition to subcategory VI–A: subcategories I–A, I–D, III–A, V–A, VII–B, and VII–C. However, evaluation of the affordability of testing, included in the economic analysis for this proposed rule (Ref. 14), leads EPA to propose that the testing of representative members of these other six subcategories be delayed until the annual aggregate production of a subcategory reaches 10 million pounds or greater, as shown by data EPA will receive from the proposed glycidyls TSCA section 8(a) reporting rule. (See Units III.B. and III.G. of this preamble) EPA proposes (as discussed in Unit III. G. of this preamble) to notify by certified letter or Federal Register notice all manufacturers (including importers) and processors of substances contained in any of these six subcategories, when the 10 million pound trigger is reached, that bioassay testing (together with other triggered tests) shall be initiated for the subcategory with an EPA-designated test substance.

EPA has selected the representative member of subcategory VI–A for testing as described in Unit III.C.3. of this preamble. The substance selected for testing from subcategory VI–A has a very high annual production volume and has exhibited mutagenic and oncogenic activity (Ref. 3).

EPA is proposing that all oncogenicity bioassay testing be conducted by gavage according to 40 CFR 798.3300, and that the subchronic (90–day) studies be conducted by gavage in accordance with 40 CFR 798.2650. To ensure a comprehensive evaluation of chronic effects, EPA considered proposing the combined chronic toxicity/oncogenicity TSCA Health Effect Testing Guideline (40 CFR 798.3320) as the test standard for the oncogenicity testing. However, EPA has decided to propose the combination of the (oral) oncogenicity testing guideline (40 CFR 798.3300) and the subchronic oral toxicity testing guideline (40 CFR 798.2650) as the test standard for the oncogenicity testing. EPA is soliciting public comment on this issue in Unit VI. of this preamble.

2. *Mutagenicity.* The proposed immediately-required mutagenicity testing and test standards for the chemical category of glycidyls is summarized in the following Table 5, which presents the two types of mutagenicity testing proposed in this rule.

TABLE 5.—PROPOSED ENTRY ASSAY FOR IMMEDIATELY-REQUIRED MUTAGENICITY TESTING AND TEST STANDARDS FOR GLYCIDYLS (NOT INCLUDING FUTURE SUBCATEGORY PRODUCTION VOLUUME-TRIGGERED TESTING)

Subcategory[1]	Subcategory member selected for testing	Entry assays		Species or system	
		Gene mutation[2]	Chromosomal aberration[2]	Gene mutation	Chromosomal aberration
None	Glycidol (CAS No. 556–52–5)	Mouse visible specific locus (§ 798.5200[4] or biochemical specific locus (§ 798.5195)	Rodent dominant lethal (§ 798.5450)	Mouse	Mouse
I–A	n-butyl glycidyl ether (CAS No. 2426–08–6)	Drosophila sex-linked recessive lethal (§ 798.5275)	Rodent dominant lethal (§ 798.5450)	Drosophila melanogaster	Mouse
I–C	Allyl glycidyl ether (CAS No. 106–92–3)	Mouse visible specific locus (§ 798.5200) or biochemical specific locus (§ 798.5195)	Rodent dominant lethal (§ 798.5450)	Mouse	Mouse
I–D	2-Ethylhexyl glycidyl ether (CAS No. 2461–15–6)	Mammalian cells in culture (§ 798.5300)	In vitro cytogenetics (§ 798.5375)	Mouse lymphoma L5/178Y TK ±	Chinese hamster ovary cells
II–A	Alkyl (C_{12}–C_{14}) glycidyl ether[5] (CAS No. 68609–97–2)	Ames test (§ 798.5265)	In vitro cytogenetics (§ 798.5375)	Salmonella typhimurium	Chinese hamster ovary cells
			In vivo cytogenetics (§ 798.5385)		Mouse
III–A	3-(Trimethoxysilyl)propyl glycidyl ether (CAS No. 2530–83–8)	Drosophila sex-linked recessive lethal (§ 798.5275)	In vitro cytogenetics (§ 798.5375)	Drosophila melanogaster	Chinese hamster ovary cells

TABLE 5.—PROPOSED ENTRY ASSAY FOR IMMEDIATELY-REQUIRED MUTAGENICITY TESTING AND TEST STANDARDS FOR GLYCIDYLS (NOT INCLUDING FUTURE SUBCATEGORY PRODUCTION VOLUME-TRIGGERED TESTING)—Continued

Subcategory[1]	Subcategory member selected for testing	Entry assays		Species or system	
		Gene mutation[2]	Chromosomal aberration[3]	Gene mutation	Chromosomal aberration
IV–A	o-Cresyl glycidyl ether[4] (CAS No. 2210–79–9)	Drosophila sex-linked recessive lethal (§ 798.5275)	None	Drosophila melanogaster	None
V–A	1,4-Butanediol diglycidyl ether (2425–79–8)	Mouse visible specific locus (§ 798.5200) or biochemical specific locus (§ 798.5195)	Rodent dominant lethal (§ 798.5450)	Mouse	Mouse
V–B[7]	1,2,3-Propanetriyl ester of 12-(Oxiranylmethoxy)-9-octadecenoic acid (CAS No. 74398–71–3)	Ames test (§ 798.5265)	In vitro cytogenetics (§ 798.5375)	Salmonella typhimurium	Chinese hamster ovary cells
		Mammalian Cells in culture (§ 798.5300)	In vivo cytogenetics (§ 798.5385)	Mouse Lymphoma L5/178Y TK ±	Mouse
VI–A	Bisphenol A diglycidyl ether (CAS No. 1675–54–3)	Mammalian Cells in culture (§ 798.5300)	Rodent dominant lethal (§ 798.5450)	Mouse Lymphoma L5/178Y TK ±	Mouse
VI–C	4-(Diglycidylamino)phenyl glycidyl ether (CAS No. 5026–74–4)	Mouse visible specific locus (§ 798.5200) or biochemical specific locus (§ 798.5195)	Rodent dominant lethal (§ 798.5450)	Mouse	Mouse
VII–A[7]	Glycidyl ester of neodecanoic acid (CAS No. 26761–45–5)	Ames test (§ 798.5265)	In vitro cytogenetics (§ 798.5385)	Salmonella typhimurium	Chinese hamster ovary cells
		Mammalian Cells in culture (§ 798.5300)	In vivo cytogenetic (§ 798.5375)	Mouse Lymphoma L5/178Y TK ±	Mouse
VII–B	Glycidyl acrylate (CAS No. 106–90–1)	Drosophila Sex-linked recessive lethal (§ 798.5275)	Rodent dominant lethal (§ 798.5450)	Drosophila melanogaster	Mouse
VII–C	Diglycidyl ester of hexahydrophthalic acid (CAS No. 5493–45–8)	Drosophila Sex-linked recessive lethal (§ 798.5275)	Rodent dominant lethal (§ 798.5450)	Drosophila melanogaster	Mouse

[1] Subcategories are defined in Unit III.C.1. of this preamble.
[2] Beginning with the gene mutation assay listed, the test substance is to be tested in the tiered battery of tests for gene mutation described in Unit V.B.2. of this preamble. All whole-animal testing is to be conducted by oral administration.
[3] Beginning with the chromosomal aberration assay listed, the test substance is to be tested in the tiered sequence of tests for chromosomal aberration described in Unit V.A.2. of this preamble. All whole-animal testing is to be conducted by oral administration.
[4] Identifies the proposed test guideline as it appears in 40 CFR part 798, proposed as the test stanard for this rule.
[5] The available health effects data for Subcategory II–A contained in Section II.2.e. of a support document (Ref. 3) indicate that the representative substance should be tested for gene mutation (complete test sequence). No relevant data were available for Subcategory II–A with respect to eliciting chromosomal aberrations. As described in Unit III.B. of this preamble, the representative substance from Subcategory II–A (having an annual aggregate production volume of greater than 1 million but less than 10 million pounds) is proposed under section 4(a)(1)(B) of TSCA is proposed to be tested in the first-tier tests only for eliciting chromosomal aberrations.
[6] *o*-Cresyl glycidyl ether is the representative substance selected from Subcategory IV–A for mutagenicity testing. As described in Table 1 of Unit IV.A of this preamble, a finding under section 4(a)(1)(A) has been made for this subcategory for gene mutation testing; thus, o-cresyl glycidyl ether is subject to the full sequence of tests employed for this effect, beginning with the test indicated. On the other hand, no finding under TSCA section 4(a)(1)(A) could be made for this subcategory for chromosomal aberration testing. As described in Unit III.F. of this preamble, a representative substance from Subcategory IV–A (having an annual production and/or importation volume of greater than 1 million but less than 10 million pounds) would normally be subject to the first-tier sequence of tests for chromosomal aberration by a finding under section 4(a)(1)(B) of TSCA. However, as presented in Section II.2.f. of a support document (Ref. 5), the available data indicate that members of this subcategory have little potential for eliciting chromosomal effects. Therefore, no tests for chromosomal effects are required for o-cresyl glycidyl ether.
[7] As described in Unit III.F. of this preamble, representative substances from Subcategories V–B and VII–A (having an annual aggregate production and/or importation volume of greater than 1 million but less than 10 million pounds) are required to be tested in the first tiers only of the test sequences for gene mutation and chromosomal aberration. No further mutagenicity or oncogenicity testing is triggered from the results of these tests.

For representative test substances for subcategories whose testing is proposed on the basis of hazard information or for subcategories having an annual aggregate production volume of 10 million pounds or greater, Table 5 presents the entry assay into each of the two mutagenicity testing batteries for gene mutation and chromosomal aberration described in Charts 1 and 2 of Unit V.B.2. of this preamble. These test substances are subject to all of the triggered mutagenicity testing depicted in these charts.

For representative test substances of subcategories having annual aggregate production volumes of 1 million pounds or more, but less than 10 million pounds, Table 5 describes the four mutagenicity assays proposed. The results from these four tests would not trigger further mutagenicity or oncogenicity testing. However, the subcategory would be subject to further mutagenicity testing, as well as oncogenicity testing, whenever its annual aggregate production volume reaches or exceeds 10 million pounds.

The general batteries of tiered tests usually employed by EPA in assessing the mutagenic (both gene mutation and chromosomal aberration) potential of chemical substances, which are included in modified form in this proposed test rule, have been previously described in proposed rules issued by EPA for mesityl oxide (48 FR 30699, July 5, 1983), cresols (48 FR 31812, July 11, 1983), and ethyltoluenes, trimethylbenzenes, and C9 aromatic hydrocarbon fraction (43 FR 23088, May 23, 1983), and are more completely described in the final Phase I test rules for mesityl oxide (50 FR 51657, December 20, 1985) and C9 aromatic hydrocarbon fraction (50 FR 20622, May 17, 1985).

EPA's responses to comments on the tiered testing batteries for gene mutation testing and for cytogenetics testing may be found in the final Phase I test rules

for the C9 aromatic hydrocarbon fraction and mesityl oxide. Further, while EPA recognizes that there is, as yet, no single generally accepted methodology for estimating human risk from mutagenic agents, it is EPA's view that appropriate methodologies do exist that, in combination, are usable for risk estimation. Therefore, EPA concludes that it is appropriate at this time to obtain mutagenicity data on certain glycidyls that will allow it to estimate mutagenic risk for regulatory purposes.

EPA is proposing a tiered testing approach to evaluate whether certain glycidyls elicit heritable gene mutations. If after a review of all relevant information, including positive results in the sex-linked recessive lethal gene mutation test in *Drosophila melanogaster*, EPA determines that further gene mutation testing is necessary, EPA would require either a mouse visible specific locus (MVSL) test or a mouse biochemical specific locus (MBSL) test. EPA believes that the MVSL or MBSL is necessary, when this lower-tier test is positive, to establish definitively whether a substance can elicit heritable gene mutations. Under the approach proposed, EPA would consider the results of all of the lower-tier tests in a review, together with other relevant information. If, after the review, EPA determined that the MVSL or MBSL was still appropriate, EPA would notify the test sponsors by letter or Federal Register notice that they must conduct one of these two tests. If EPA determined that a test was no longer necessary, EPA would notify the test sponsors by letter or Federal Register notice that further testing was not triggered. EPA's rationale in allowing test sponsors to use either the MVSL or MBSL test is described in a final rule published in the Federal Register of April 5, 1990 (55 FR 12639).

Previous test rules (mesityl oxide, 50 FR 51857, December 20, 1985; and C9 aromatic hydrocarbon, 50 FR 20622, May 17, 1985, are examples) have included a requirement that certain test results (positive for testing based on preliminary hazard data; positive or equivocal for testing based on production volume) in one or more of the following mutagenicity assays resulted in a requirement for chronic oncogenicity bioassay testing: (1) The gene mutation assay in mammalian cells in culture; (2) the sex-linked recessive lethal gene mutation assay in *Drosophila melanogaster*; (3) the *in vitro* cytogenetics assay in mammalian cells; and (4) the *in vivo* mammalian cytogenetics assay. However, owing to the complex nature of this category test rule and certain economic considerations, for the purposes of this test rule only, EPA is not proposing to trigger oncogenicity testing from mutagenicity test results. Rather, EPA is proposing that glycidol or a representative member of any subcategory be tested for oncogenicity whenever the annual production volume of the substance or the annual aggregate production volume of the subcategory reaches or exceeds 10 million pounds. EPA's proposed TSCA section 8(a) rule for monitoring production volume and proposed mechanism for notifying manufacturers that testing must be initiated are discussed in Unit III.G. of this preamble.

The test batteries for mutagenicity which EPA is proposing for selected members of this chemical category are depicted in the following charts:

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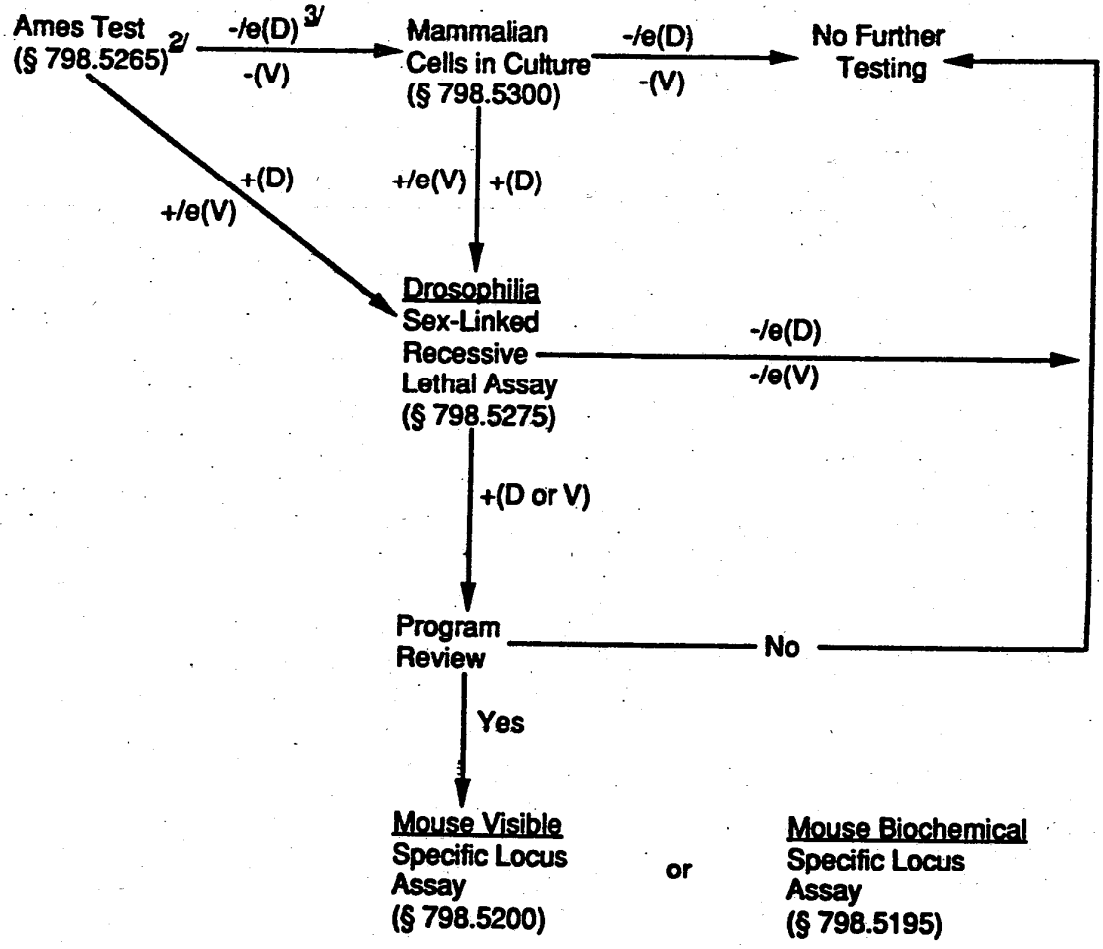
CHART 1 -- MUTAGENICITY TESTING SEQUENCE FOR GENE MUTATION [1/]

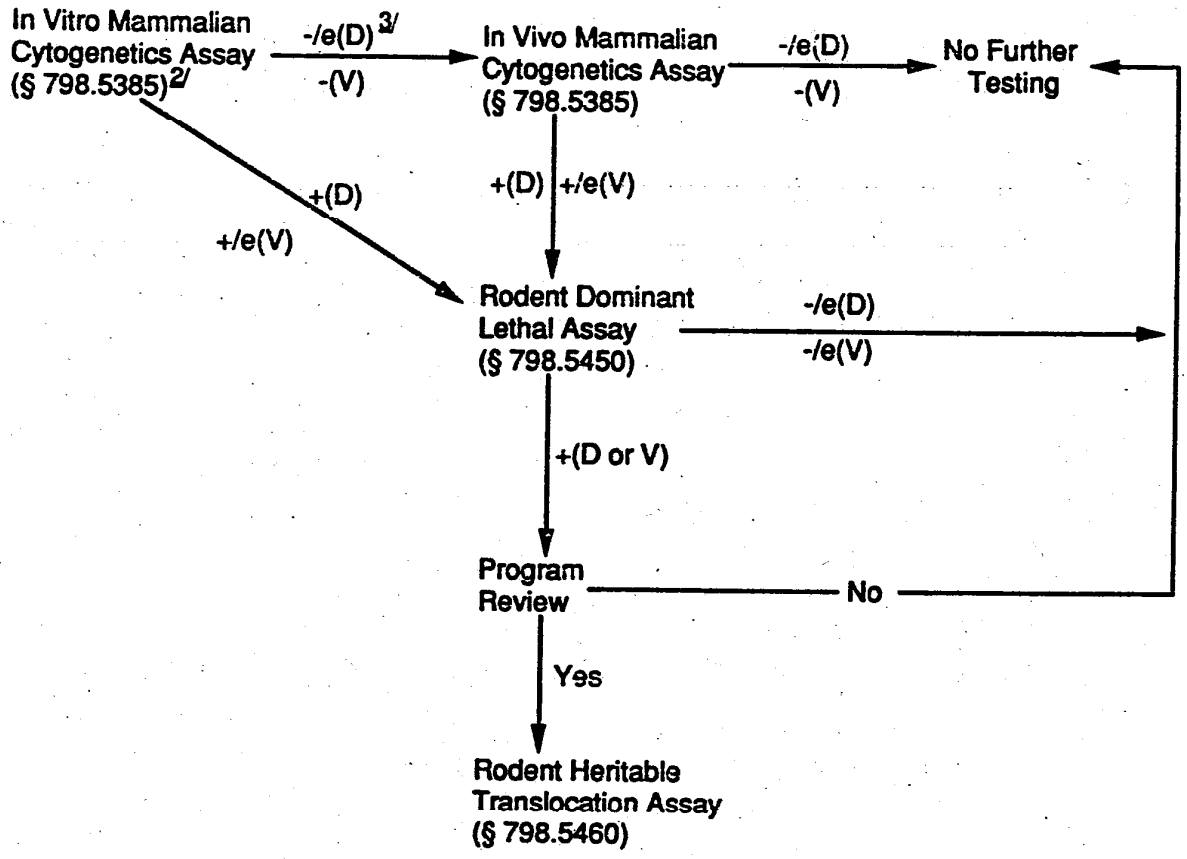


1/ This scheme applies to representative test substances for subcategories for which testing has been proposed based on available hazard information or for subcategories having annual aggregate production volumes of 10 million pounds or greater. Representative test substances for subcategories having aggregate annual production volumes of 1 million pounds or greater, but less than 10 million pounds, are proposed to be tested only in the Ames Test and Mammalian Cells in Culture test, with no triggering to further mutagenicity testing. If the subcategories subject to this proposed limited testing later attain annual aggregate production volumes of 10 million pounds or greater, then representative members are subject to the entire testing sequence.

2/ 40 CFR citation for the appropriate TSCA Health Effects Testing Guideline which is proposed as the test standard.

3/ Indicates result (+ is positive; e is equivocal; and - is negative) required for substances being tested because of preliminary hazard data on the subcategories (D), or because the subcategory annual aggregate production volume testing trigger (10 million pounds or greater) has been met (V).

CHART 2 -- MUTAGENICITY TESTING SEQUENCE FOR CHROMOSOMAL ABERRATION [1/]



1/ This scheme applies to representative test substances for subcategories for which testing has been proposed based on available hazard information or for subcategories having annual aggregate production volumes of 10 million pounds or greater. Representative test substances for subcategories having annual production volumes of 1 million pounds or greater, but less than 10 million pounds, are proposed to be tested only in the In Vitro and In Vivo Mammalian Cytogenetics assay, with no triggering to further mutagenicity or oncogenicity testing. If the subcategories subject to this proposed limited testing later attain annual aggregate production volumes of 10 million pounds or greater, then representative memebers are subject to the entire testing sequence.

2/ 40 CFR citation for the appropriate TSCA Health Effects Testing Guidleline which is proposed as the test standard.

3/ Indicates result (+ is positive; e is equivocal; and - is negative) required for substances being tested because of preliminary hazard data on the subcategories (D), or because the subcategory annual aggregate production volume testing trigger (10 million pounds or greater) has been met (V).

EPA is proposing that glycidol and the selected representative members of the subcategories listed in Table 5 shall be tested in both the tiered sequences of tests for gene mutation and chromosomal aberration described in this Unit. EPA has proposed the specific mutagenicity assays that will serve, except as noted, as the entry points for each substance into these two complete testing sequences, using EPA's weight-of-the-evidence evaluation of the data contained in sections II.1. and 2. of the support document (Ref. 3).

EPA's proposed immediately-required mutagenicity testing and test standards are summarized in Table 5. For whole-animal assays, EPA is proposing the species, and the gavage route for exposure. For the one whole-animal mutagenicity test not appearing in Table 5, the rodent heritable translocation assay, EPA is proposing 40 CFR 798.5460 as the test standard, the mouse as the species, and gavage administration. For the *in vitro* studies, EPA is proposing the test system in Table 5.

3. *Developmental toxicity.* As shown in Table 4, EPA is proposing that nine members of the nine subcategories listed be immediately tested for developmental toxicity either in rats and mice according to the test standard described in 40 CFR 798.4900 or screened for developmental toxicity in rats according to the test standard described in 40 CFR 798.4420. EPA is proposing that all testing be conducted by gavage.

4. *Reproductive toxicity.* EPA is proposing that the seven substances listed in Table 4 be immediately tested for reproductive toxicity using the test standard described in 40 CFR 798.4700. EPA is proposing that all testing be performed by gavage.

5. *Neurotoxicity.* EPA is proposing that the 12 substances listed in Table 4 be immediately tested in oral (gavage) neurotoxicity studies in the rat. The tests to be performed and the proposed test standards are the following: (a) An acute and subchronic functional observational battery (40 CFR 798.6050); (b) an acute and subchronic motor activity test (40 CFR 798.6200); and a subchronic neuropathology test (40 CFR 798.6400). The subchronic neurotoxicity tests could be combined with the oral toxicity test, provided all test guideline criteria are followed, using 10 animals for each dose per sex.

As noted in Table 4, in some cases only subchronic neurotoxicity studies are proposed. To minimize and distribute testing costs while ensuring adequate testing, EPA is proposing to require subchronic neurotoxicity testing whenever neurotoxicity testing is appropriate, but to require acute neurotoxicity testing only when there are preliminary hazard data indicating a concern for neurotoxicity or when the subcategory testing has been triggered by an annual subcategory production volume of 10 million pounds or greater. EPA solicits public comment on this approach.

6. *Subchronic (90–day) toxicity.* Many of the substances for which EPA is proposing immediate testing for subchronic toxicity could also be subject later to proposed oncogenicity testing. Only one substance is currently subject to proposed testing for oncogenicity and subchronic toxicity (bisphenol A diglycidyl ether; CAS No. 1675–54–3). Therefore, EPA is proposing that bisphenol A diglycidyl ether, together with substances for which EPA has preliminary data indicating a concern only for subchronic or chronic effects (listed in Table 4), be tested immediately for subchronic (90–day) toxicity in the rat by gavage, using 40 CFR 798.2650 as the test standard. This subchronic testing in the rat, as well as subchronic testing in the mouse, is already proposed for bisphenol A diglycidyl ether as part of the proposed test standard for oncogenicity testing. For certain other substances, the required subchronic toxicity study in the rat may provide the basis for setting dosage levels for oncogenicity testing in this species, should production data later trigger oncogenicity testing. Since many of the test substances have low vapor pressures, are known skin irritants and elicit dermal sensitization reactions, EPA is proposing gavage studies.

C. Test Substances

EPA is proposing that all of the test substances be monomeric and of at least 99–percent purity. The concentrations of suspected impurities contained in the test substances, such as epichlorohydrin, would be determined and reported. EPA is specifying relatively pure monomeric substances for testing because EPA is interested in evaluating the effects attributable to these substances themselves.

D. Persons Required to Test

EPA is proposing that persons who manufacture and/or process, or who intend to manufacture and/or process, any glycidyl on, or added to, the public or confidential portions of the TSCA section 8(b) Inventory, at any time from the effective date of the final test rule to the end of the reimbursement period, be subject to the testing proposed by this rule. Those who manufacture or import glycidyls as byproducts are considered manufacturers under this rule.

TSCA section 5(b) requires that manufacturers of any new glycidyl, as defined in Unit III.C.1. of this preamble, comply with a TSCA section 4(a) test rule on that substance prior to submitting a premanufacture notice (PMN) for the new substance under TSCA section 5(a). However, EPA is proposing to defer such compliance until after the chemical is reported to the TSCA Inventory. Persons should also note that, although they are subject to the rule, certain persons who manufacture chemicals may be treated similarly to processors under the procedural rule implementing TSCA section 4. (See 40 CFR 790.42.)

As described in Unit IV. of this preamble, under TSCA section 4(a)(1)(B), EPA has proposed making findings that the entire glycidyls category is produced in substantial quantities and that there is or may be substantial human exposure on a category-wide basis. However, to minimize the cost of testing, EPA proposes to trigger testing required under TSCA section 4(a)(1)(B) by subcategory aggregate annual production volumes, with the manufacturers and importers of glycidol or of all substances in a given subcategory paying for the testing of a representative member. For proposed immediately-required testing, EPA has selected a representative member from each subcategory as the proposed test substance. For future proposed production volume-triggered testing, EPA has specified in Unit III.C.3. of this preamble the criteria to be used in selecting a representative test substance.

In addition to the finding under TSCA section 4(a)(1)(B), under TSCA section 4(a)(1)(A) EPA proposes to find that the glycidyls category may present an unreasonable risk of injury to health. However, aside from production volume-triggered testing, when testing is being required because preliminary data indicate that a subcategory may contain members which are oncogenic or mutagenic, EPA intends to require testing of one substance within the subcategory to be paid for by all manufacturers and processors of all substances within the subcategory. For all other health effects, EPA intends to require testing only when preliminary data on a specific substance indicate a concern for a particular health effect, and the costs for the testing would be borne only by the manufacturers and processors of that specific chemical.

1. *Proposed immediately-required testing.* For proposed immediately-required testing, EPA has considered the

following factors in determining who would pay for testing: (a) Whether preliminary hazard data or subcategory annual aggregate production volume, or both, formed the primary basis of concern for proposed testing; (b) the relative ability of the specific test to predict an unreasonable risk of injury to health (for example, a 90-day subchronic toxicity study which investigates multiple health effect endpoints has a greater relative ability to predict injury to health than a test, such as the Ames gene mutation test, which investigates only a single health effect endpoint); (c) the affordability of the testing; and (d) the desirability to minimize, as a matter of policy, the testing burden while, at the same time, ensuring the development of test data adequate for EPA's risk assessment purposes. Proposed immediately-required testing consists of both subcategory-specific and chemical-specific testing based on preliminary data and subcategory-specific testing based on aggregate annual subcategory production volume. Where testing is based on production volume-triggered testing, all manufacturers and processors pay, where subcategory-specific testing is required due to a hazard-based concern for oncogenicity or mutagenicity, all manufacturers and processors pay, and where testing is required based on a chemical-specific hazard concern, only manufacturers and processors of the specific substance(s) pay. However, there are instances in which a test is proposed for a subcategory on the basis of its production volume, but the subcategory also contains one or more members for which the same test requirement is proposed on the basis of preliminary hazard data, presenting a variety of possible test requirement options.

One option would be to require the manufacturers and processors of any substance for which there are preliminary suggestive hazard data to conduct that testing, while selecting another member of the subcategory to be tested to satisfy the subcategory testing triggered by aggregate annual production volume. This approach would increase the total amount of testing, but does not consider the relative ability of the specific test to predict unreasonable risk of injury to health.

Another option would be to select, as the representative test substance to satisfy a proposed subcategory-specific test requirement, one of the subcategory members for which there are preliminary suggestive hazard data, and therefore a chemical-specific test requirement, for the same endpoint. A criterion, such as the highest production volume among the subcategory members subject to that chemical-specific requirement, could be used to select the test substance to satisfy also the production volume-triggered subcategory- specific requirement for the same test. This approach would decrease the amount of total testing, but does not consider the relative ability of a specific test to determine an unreasonable risk of injury to health. It might also be viewed as inequitable by the manufacturers and processors of the other subcategory members subject to the test on a chemical-specific basis, who would not receive the cost-sharing benefits available to the manufacturers and processors of the representative substance. Other approaches are also possible.

Taking these considerations into account, EPA has selected proposed persons required to test listed in Table 4 of Unit V. of this preamble in the following manner, and requests comment upon this approach: (a) The manufacturers and processors of glycidol are required to test that substance; (b) all manufacturers and processors of all substances in a given subcategory are required to test a representative member whenever mutagenicity or oncogenicity test requirements are based on preliminary adverse hazard data or whenever testing for any effect is triggered by annual subcategory production volume; (c) the manufacturers and processors of a given substance are required to test that substance for effects other than oncogenicity and mutagenicity when the basis for the testing is preliminary hazard data.

When testing proposed for a representative substance of a subcategory is based on subcategory aggregate annual production volume, and there are also preliminary adverse hazard data for one or more substances within the subcategory for the same effect, then the following selection criteria were used:

a. If testing is proposed for a substance based on adverse hazard information and that substance is a member of a subcategory having an annual aggregate production volume of 10 million pounds or greater, then the manufacturers and processors of all substances within the subcategory are required to test. EPA believes that this approach will equitably distribute the relatively greater testing costs incurred by such subcategories.

b. For subchronic toxicity testing, which has a somewhat greater relative ability than many other single tests to determine unreasonable risk of injury to health, for subcategories having annual aggregate production volumes of at least 1 million but less than 10 million pounds, manufacturers and processors of specific substances in a given subcategory for which proposed chemical-specific testing is based on adverse preliminary hazard data are required to test the specific substances; manufacturers and processors of all of the substances within the subcategory would be required to test a different representative test substance to satisfy the subcategory production volume-triggered testing requirement.

c. For neurotoxicity testing, for subcategories having annual aggregate production volumes of at least 1 million but less than 10 million pounds (triggering a subcategory requirement for subchronic neurotoxicity testing only) which also contain one or more members subject to both acute and subchronic neurotoxicity testing because of preliminary hazard data for acute and subchronic neurotoxicity, those members would be selected as the representative test substances to satisfy subcategory volume-triggered testing requirements for subchronic neurotoxicity. The subchronic testing would be paid for by all manufacturers and importers of all substances in the given subcategory. However, because acute testing would not be automatically required until a subcategory's annual aggregate production volume reached or exceeded 10 million pounds, the manufacturers and processors of those representative test substances would be required to conduct the additional acute neurotoxicity testing based on preliminary hazard data demonstrating potential acute neurotoxicity.

2. *Future production volume-triggered testing.* For future production volume-triggered testing for glycidol or for subcategories under TSCA section 4(a)(1)(B), all manufacturers and processors of glycidol or of each substance in the subcategory would be required to test a representative test substance. EPA believes that this proposed selection of persons required to test will equitably distribute the testing burden while ensuring the development of test data adequate for risk assessment purposes. EPA requests public comment on this approach.

3. *General testing considerations.* Because TSCA contains provisions to avoid duplicative testing, not every person subject to this rule must individually conduct testing. Section 4(b)(3)(A) of TSCA provides that EPA may permit two or more manufacturers

or processors who are subject to this rule to designate one person or a qualified third person to conduct the tests and submit data on their behalf. TSCA section 4(c) provides that any person required to test may apply to EPA for an exemption from the requirement.

Manufacturers (including importers) subject to this rule are required to submit either a letter of intent to test or an exemption application within 30 days after the effective date of the final test rule. The required procedures for submitting such letters and applications are described in 40 CFR part 790.

Processors subject to this rule, unless they are also manufacturers, are not required to submit letters of intent or exemption applications, or to conduct testing unless manufacturers fail to submit notices of intent to test or later fail to sponsor the required tests. EPA expects that the manufacturers will pass an appropriate portion of the costs of testing on to processors through the pricing of their products or reimbursement mechanisms. If manufacturers perform all the required tests, processors will be granted conditional exemptions automatically. If manufacturers fail to submit notices of intent to test or fail to sponsor all the required tests, EPA will publish a separate notice in the Federal Register to notify processors to respond; this procedure is described in 40 CFR part 790.

EPA is not proposing to require the submission of equivalence data as a condition for exemption from the proposed testing of certain substances subject to this test rule. EPA is interested in evaluating the effects attributable to these substances themselves, and therefore, has specified relatively pure substances for testing.

Manufacturers and processors who are subject to this test rule must comply with the test rule development and exemption procedures in 40 CFR part 790 for single-phase rulemaking.

E. Reporting Requirements

1. Under TSCA section 4, EPA is proposing that all data developed under this rule be reported in accordance with its TSCA Good Laboratory Practice Standards (GLPS), which appear in 40 CFR part 792.

EPA is required by TSCA section 4(b)(1)(C) to specify the time period during which persons subject to a test rule must submit test data. EPA is proposing specific reporting requirements for each of the proposed test standards as presented in Tables 2 and 3 of Unit V.A. of this preamble and in the sample regulatory language contained in this preamble.

As presented in Tables 2 and 3 of Unit V.A., the proposed reporting requirements for testing triggered by TSCA section 8(a) reports are calculated from the date of notification by EPA of manufacturers/importers of glycidol or of all substances in a given subcategory that testing should be initiated, with two exceptions. For the MVSL or MBSL and the heritable translocation cytogenetics test in the mouse, the proposed reporting requirements are calculated from the date of EPA's notification of manufacturers/importers that such testing should be initiated.

For immediately required testing proposed in Unit V.B. of this preamble, the time periods allowed for the proposed reporting requirements are the same as those presented in Tables 2 and 3 of Unit V.A.of this preamble, except that these requirements are calculated from the effective date of the final rule, with two exceptions. Proposed reporting requirements for the MVSL or MBSL gene mutation test and the heritable translocation cytogenetics test in the mouse are calculated from the date of EPA's notification of the test sponsor(s) that such testing should be initiated.

TSCA section 14(b) governs EPA's disclosure of all test data submitted pursuant to section 4 of TSCA. Upon receipt of data required by this rule, EPA will publish a notice of receipt in the Federal Register as required by section 4(d) of TSCA.

Persons who export a chemical substance or mixture which is subject to a final TSCA section 4 rule are subject to the export reporting requirements of section 12(b) of TSCA. Regulations implementing TSCA section 12(b) are found in 40 CFR part 707. To fulfill the annual export notification requirement and for the purposes of this rule only, EPA proposes to require persons to submit one notice per country for the first manufacture of any member of the category of glycidyls.

2. Under TSCA section 8, EPA is proposing that any person who manufactures or imports any of the chemical substances currently comprising the chemical category of glycidyls (publicly identified members of which are listed in Unit III.C.1. of this preamble), or any chemical substance falling within the definition of this chemical category which has subsequently been entered into either the public or confidential portion of the TSCA Chemical Substance Inventory, as of the effective date of the final test rule for this chemical category would submit a report to EPA within 60 days after the conclusion of their corporate fiscal year in which the person manufactured or imported any of these substances.

Any person who manufactures or imports any of these chemical substances in a year following that for which an initial report was submitted would be required to submit a new report within 60 days of the conclusion of that corporate fiscal year.

The report would contain the following information:

(a) Company name and address.

(b) Name, address, and telephone number of the principal technical contact.

(c) The identity and Chemical Abstracts Service registry number (CAS number) of each substance manufactured or imported.

(d) The quantity (by weight) of each substance manufactured or imported during the latest corporate fiscal year.

If this report is submitted within the year preceding the start of a reporting period under the Inventory Update Rule, the submitter would not be required to report the same information again for that reporting period. The details of this exemption are set forth in 40 CFR 710.35.

F. Tentative Regulatory Language

Because this rule is novel in many ways, EPA is not proposing complete rule language at this time. EPA believes that the tests and reporting requirements proposed are adequately presented in this preamble for comment. EPA recognizes, however, that there may be certain aspects of the proposal that are not included in the sample regulatory text. For example, EPA's proposal to review "new" data that did not exist until after the effective date of the final rule prior to notification of persons that they are required to test is currently described in the preamble. If adopted, it would be added to the regulatory text of the final rule.

1. The following is representative proposed language for reporting requirements:

§ 704.xx Glycidol and its derivatives.

(a) *Substances for which reporting is required.* The chemical substances for which reporting is required under this rule consist of glycidol and its ethers and esters, as defined in § 799.xxxx of this chapter, which are currently listed on, or added to, the public or confidential portions of the TSCA Inventory of Chemical Substances maintained by EPA under TSCA section 8(b) at any time after (the effective date of the final rule). New chemical substances meeting this definition shall also be subject to this section once

entered into the TSCA Inventory of Chemical Substances.

(b) *Persons who must report.* The following persons, unless exempt as provided in § 704.5 of this chapter, are subject to the reporting requirements of this rule; a person may be required to report more than once in response to this rule.

(1) *Initial reporting.* Persons who manufacture or import any substance identified in paragraph (a) of this section for commercial purposes during the person's latest complete corporate fiscal year prior to (the effective date of the final rule) are required to report.

(2) *Subsequent reporting.* Persons who manufacture or import any substance identified in paragraph (a) of this section for commercial purposes after (the effective date of the final rule) are required to report. The persons described in this paragraph (b)(2) include persons who report initially in response to paragraph (b)(1) of this section and persons who commence the manufacture or importation of any substance identified in paragraph (a) of this section after (the effective date of the final rule).

(c) *When to report*—(1) *Initial reporting.* Persons described in paragraph (b)(1) of this section must submit an initial report within 60 days of (the effective date of the final rule).

(2) *Subsequent reporting.* Persons described in paragraph (b)(2) of this section must submit a report within 60 days of the completion of each corporate fiscal year during which they manufacture or import any substance identified in paragraph (a) of this section. Persons shall submit a separate report for each corporate fiscal year in which they are subject to this section.

(3) *Duplicctive reporting.* Persons reporting under this section are exempt, pursuant to 40 CFR 710.35, from duplicative reporting for the Inventory Update rule.

(d) *What information to report.* All persons subject to this section shall report the following information to EPA:

(1) Company name and headquarters address.

(2) Name, address, and telephone number (including area code) of the company's principal technical contact.

(3) The chemical name and Chemical Abstracts Service Registry Number (CAS number) of each chemical substance identified in paragraph (a) manufactured or imported during the latest complete corporate fiscal year.

(4) The quantity (in pounds) of each such substance manufactured or imported during the latest complete corporate fiscal year.

(e) *Where to send reports.* Reports must be submitted by certified mail to the United States Environmental Protection Agency, OTS Document Receipt Office, 401 M St., SW., Washington, DC 20460, Attn: Glycidol and its derivatives.

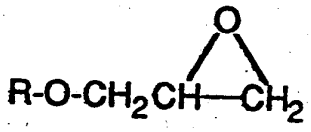
2. The following is representative proposed language for the test rule for these chemical substances. Upon final promulgation, the test rule will be added to part 799, subpart B.

§ 799.xxxx Glycidol and its derivatives.

(a) *Scope and Purpose.* This section requires persons who manufacture, import, or process members of the chemical category glycidol and its derivatives ("glycidyls") to conduct health effects testing. The type of testing required depends in part upon the aggregate annual production volume of the subcategory of which a particular chemical substance is a member. When the annual production volume of a particular subcategory reaches 10 million pounds, persons who manufacture, import, or process members of the subcategory will be responsible for conducting comprehensive testing of a representative member of the subcategory. When the aggregate annual production volume of a particular subcategory reaches 1 million pounds but is less than 10 million pounds, persons who manufacture, import, or process members of the subcategory will be responsible for conducting screening testing of a representative member of the subcategory. Further, this section specifies additional health effects testing for certain members of the category of glycidyls as specified in this section.

(b) *Definitions.* The definitions in section 3 of TSCA and the definitions of § 790.3 of this chapter also apply to this section.

(1) *Glycidol and its derivatives,* also referred to as "glycidyls," refers to chemical substances of the general formula:



Where R is a hydrogen atom or any alkyl, aryl, or acyl group. R is unrestricted as to the number and type of substituents it may carry.

(2) *Comprehensive subcategory testing* refers to testing of one chemical substance within a chemical subcategory whose aggregate annual production equals r exceeds 10 million pounds. The testing to be conducted is testing according to the following guidelines included in part 798 of this chapter, with certain modifications as included in paragraph (g) of this section:

(i) Oncogenicity, § § 798.3300 and 798.2650.

(ii) Developmental Toxicity, § 798.4900.

(iii) Reproductive Toxicity, § 798.4700.

(iv) Acute Neurotoxicity, § § 798.6050 and 798.6200.

(v) Subchronic neurotoxicity. § § 798.6050, 798.6200, 798.6400.

(vi) Mutagenicity § § 798.5265, 798.5300, 798.5275, 798.5200 or 798.5195, 798.5375, 798.5385, 798.5450, 798.5460.

(3) *Screening subcategory testing* refers to testing of one chemical substance within a chemical category whose aggregate annual production equals or exceeds 1 million pounds but is less than 10 million pounds. The testing to be conducted is testing according to the following guidelines included in part 798 of this chapter, with certain modifications as included in paragraph (h) of this section:

(i) Subchronic toxicity § 798.2650.

(ii) Developmental toxicity screen § 798.4420.

(iii) Mutagenicity screen § § 798.5265, 798.5300, 798.5375, 798.5385.

(iv) Subchronic neurotoxicity screen § § 798.6050, 798.6400, 798.6200

(4) *Health effect-specific subcategory testing* refers to mutagenicity testing of one chemical substance, within a chemical subcategory having an annual aggregate production volume of less than 10 million pounds, for which testing is based on preliminary hazard information. The mutagenicity testing to be conducted is testing according to the following guidelines included in part 798 of this chapter, with certain modifications as included in paragraph (i) of this section:

(i) Mutagenicity § § 798.5265, 798.5300, 798.5275, 798.5200 or 798.5195, 798.5375, 798.5385, 798.5450, and 798.5460.

(ii) [Reserved]

(5) *Health effect-specific testing for specific substances* refers to testing of specific chemical substances for neurotoxicity, reproductive and fertility effects, or subchronic toxicity. The testing to be conducted is testing according to the following guidelines included in part 798 of this chapter, with certain modifications as included in paragraph (j) of this section:

(i) Acute neurotoxicity § § 798.6050 and 798.6200.

(ii) Subchronic neurotoxicity § § 798.6050, 798.6200, 798.6400.

(iii) Reproductive toxicity § 798.4700.

(iv) Subchronic toxicity § 798.2650.

(c) *Chemical substances subject to testing.* (1) This section applies to any chemical substance within the category "glycidol and its derivatives." The chemical substances in this category listed on the TSCA section 8(b) public inventory are identified in this paragraph. (Glycidol and a list of all other substances meeting the definitions of the substances contained in the 21 subcategories of its derivatives at the time of this proposed rule are identified in a table in Unit III.C.1. of this preamble. For the final test rule, the list will be included in the codified text).

(2) This section also applies to any new chemical substance within the category of "glycidol and its derivatives." However, persons subject to this section by virtue of their intention to manufacture or import a new chemical substance in the category of "glycidol and its derivatives" are not required to comply with this section prior to submitting a premanufacture notification (PMN) under TSCA section 5(a) for such substance. However, they must comply with this section once the substance is added to the TSCA section 8(b) Inventory.

(d) *Persons required to submit study plans, conduct tests, and submit data—* (1) *Production volume-triggered testing—*(i) *Comprehensive subcategory testing.* (A) Except as provided in paragraph (c)(2) of this section, all persons who manufacture (including import) or process or intend to manufacture or process glycidol, or any member or any combination of members of a subcategory of the category glycidol and its derivatives as listed in paragraph (c) of this section that attains an annual aggregate production volume of at least 10 million pounds, as described in paragraph (d)(1)(i)(B) of this section or as determined by EPA pursuant to paragraph (d)(1)(iii) of this section from TSCA section 8(a) reports submitted pursuant to § 704.XX of this chapter, from the effective date of this section to the end of the reimbursement period, shall submit letters of intent to test, submit study plans, conduct tests, and submit data, or submit exemption applications, as described in this section, subpart A of this part, and parts 790 and 792 of this chapter for single-phase rulemaking.

(B) EPA has determined that Subcategory VI–A as identified in paragraph (c) of this section has met the annual aggregate production volume trigger of 10 million pounds and is therefore subject to comprehensive subcategory testing in accordance with this section.

(ii) *Screening subcategory testing.* (A) All persons who manufacture (including import) or process or intend to manufacture or process glycidol, or any member or any combination of members of a subcategory of the category glycidol and its derivatives as listed in paragraph (c) of this section that attains an annual aggregate production volume of at least 1 million pounds, but less than 10 million pounds, as described in paragraph (d)(1)(ii)(B) or as determined by EPA pursuant to paragraph (d)(1)(iii) of this section from TSCA section 8(a) reports submitted pursuant to § 704.XX of this chapter, from the effective date of this section to the end of the reimbursement period, shall submit letters of intent to test, submit study plans, conduct tests, and submit data, or submit exemption applications, as described in this section, subpart A of this part, and parts 790 and 792 of this chapter for single-phase rulemaking.

(B) EPA has determined that Subcategories I–A, I–C, II–A, III–A, IV–A, V–B, VII–A, and VII–B as identified in paragraph (c) of this section have met the annual aggregate production volume trigger of 1 million pounds, but less than 10 million pounds, and are therefore subject to screening subcategory testing in accordance with this section.

(iii) *Future testing.* (A) EPA will notify all persons required to conduct testing pursuant to paragraphs (d)(1)(i) and (d)(1)(ii) of this section by certified letter or Federal Register notice that the annual production volume of glycidol or a specific subcategory has reached either 1 or 10 million pounds, as applicable, and that testing shall be initiated pursuant to this section using an EPA-specified representative test substance.

(B) Subcategories of glycidol derivatives that become subject to this section under this paragraph shall be added to paragraph (d)(1)(i)(B) or (d)(1)(ii)(B) and paragraphs (e) and (f) of this section on a yearly basis by Federal Register notice.

(C) Persons who manufacture, import, or process these substances only as an impurity are not subject to these requirements.

(2) *Health effect-specific subcategory mutagenicity testing.* (i) Except as provided in paragraph (c)(2) of this section, all persons who manufacture (including import) or process or intend to manufacture or process any member, or any combination of members of the following subcategories of the category glycidol and its derivatives as identified in paragraph (c) of this section, from the effective date of this section to the end of the reimbursement period, shall submit letters of intent to test, submit study plans, conduct tests, and submit data, or submit exemption applications, as described in this section, subpart A of this part, and parts 790 and 792 of this chapter for single-phase rulemaking: glycidol and Subcategories I–A, I–C, I–D, II–A, III–A, IV–A, V–A, VI–A, VI–C, VII–B, and VII–C.

(ii) Persons who manufacture, import, or process these substances only as an impurity are not subject to these requirements.

(3) *Health effect-specific testing for specific substances.* (i) All persons who manufacture (including import) or process or intend to manufacture or process glycidol or any of the following members of the category glycidol and its derivatives, from the effective date of this section to the end of the reimbursement period, shall submit letters of intent to test, submit study plans, conduct tests, and submit data, or submit exemption applications, as described in this section, subpart A of this part, and parts 790 and 792 of this chapter for single-phase rulemaking. The substances for which persons are subject to testing under this paragraph are as follows:

TABLE 1.—SUBSTANCES SUBJECT TO HEALTH EFFECTS TESTING

Testing Endpoint	Chemical Substance	CAS No.
Subchronic Toxicity	*n*-butyl glycidyl ether	2426-08-6
	alkyl (C_8-C_{14}) glycidyl ether	68609-96-1
	1,4-butanediol diglycidyl ether	2425-79-8
	alkyl (C_{12}-C_{13}) glycidyl ether	68081-84-5
	glycidyl methacrylate	106-91-2
	neopentyl glycol diglycidyl ether	17557-23-2
Neurotoxicity	glycidol	556-52-5
	n-butyl glycidyl ether	2426-08-6

TABLE 1.—SUBSTANCES SUBJECT TO HEALTH EFFECTS TESTING—Continued

Testing Endpoint	Chemical Substance	CAS No.
	allyl glycidyl ether	106-92-3
	3-(trimethoxysilyl)propyl glycidyl ether	2530-83-8
	phenyl glycidyl ether	122-60-1
	o-cresyl glycidyl ether	2210-79-9
	1,4-butanediol diglycidyl ether	2425-79-8
Reproductive and Fertility Effects	glycidol	556-52-5
	n-butyl glycidyl ether	2426-08-6
	alkyl (C_8-C_{10}) glycidyl ether.	68609-96-1
	allyl glycidyl ether	106-92-3
	3-(trimethoxysilyl)propyl glycidyl ether	2530-83-8
	phenyl glycidyl ether	122-60-1

(ii) Persons who manufacture, import, or process these substances only as an impurity are not subject to these requirements.

(e) *Test substances*—(1) *Comprehensive subcategory testing.* The following representative test substances, identified by chemical name, Chemical Abstracts Service Registry Number (CAS No.), and subcategory, as identified in paragraph (c) of this section, shall be tested in accordance with this section:

TABLE 2.—SUBSTANCES SUBJECT TO COMPREHENSIVE SUBCATEGORY TESTING

Test Substance	CAS No.	Sub-category
Bisphenol A diglycidyl ether	1675-54-3	VI-A

(2) *Screening subcategory testing.* The following representative test substances, identified by chemical name, Chemical Abstracts Service Registry Number (CAS No.), and subcategory, as identified in paragraph (c) of this section, shall be tested in accordance with this section:

TABLE 3.—SUBSTANCES SUBJECT TO SCREENING SUBCATEGORY TESTING

Test Substance	CAS No.	Sub-category
n-butyl glycidyl ether	2426-08-6	I-A
tert-butyl glycidyl ether	7665-72-7	I-A
allyl glycidyl ether	106-92-3	I-C
alkyl (C_{12}-C_{14}) glycidyl ether	68609-97-2	II-A
3-(trimethoxysilyl) propyl glycidyl ether	2530-83-8	III-A
o-cresyl glycidyl ether	2210-79-9	IV-A
phenyl glycidyl ether	122-60-1	IV-A
1,2,3-propanetriyl ester of 12- (oxiranylmethoxy)- 9-octadecenoic acid	74398-71-3	V-B
glycidyl ester of neodecanoic acid	26761-45-5	VII-A
glycidyl methacrylate	106-91-2	VII-B
glycidyl acrylate	106-90-1	VII-B

(3) *Selection criteria used by EPA for selection of representative test substances for testing shared by all manufacturers, importers, and processors of a subcategory*—(i) *Mutagenicity and oncogenicity.* For mutagenicity and oncogenicity testing triggered by future production volume, EPA will consider mutagenicity and oncogenicity test data on subcategory members and structural analogues, in addition to production volume and exposure data, in selecting the test substance.

(ii) *Other health effects.* For subcategory testing for all health effects other than mutagenicity and oncogenicity triggered by future production volume, EPA will determine from TSCA section 8(a) reports submitted pursuant to § 704.XX of this chapter the substance having the largest production (including importation) volume and specify that subcategory member as the representative test substance, unless available exposure information indicates that a different substance has a higher human exposure potential.

(4) *Health effect-specific subcategory mutagenicity testing.* The following representative substances, identified by chemical name, Chemical Abstracts Service Registry Number (CAS. No.), and subcategory, as identified in paragraph (c) of this section, shall be tested in accordance with this section:

TABLE 4.—SUBSTANCES SUBJECT TO MUTAGENICITY TESTING

Test Substance	CAS No.	Sub-category
glycidol	556-52-5	None
n-butyl glycidyl ether	2426-08-6	I-A
allyl glycidyl ether	106-92-3	I-C
2-ethylhexyl glycidyl ether	2461-15-6	I-D
alkyl (C_{12}-C_{14}) glycidyl ether	68609-97-2	II-A
3-(trimethoxysilyl) propyl glycidyl ether	2530-83-8	III-A
o-cresyl glycidyl ether	2210-79-9	IV-A
1,4-butanediol diglycidyl ether	2425-79-8	V-A
4-(diglycidylamino)phenyl glycidyl ether	5026-74-4	VI-C
glycidyl acrylate	106-90-1	VII-B
diglycidyl ester of hexahydrophthalic acid	5493-45-8	VII-C

(5) *Purity of the representative test substances.* All test substances shall be of at least 99 percent purity and exhibit a molecular weight that indicates a monomeric state.

(f) *Required testing—(1) Comprehensive subcategory testing (annual aggregate subcategory production volume equal to or greater than 10 million pounds).* (i) The representative test substance in subcategory VI–A, identified in paragraph (e)(1) of this section, shall be tested for oncogenicity, subchronic toxicity, acute and subchronic neurotoxicity, developmental toxicity, reproductive toxicity and mutagenicity, pursuant to paragraph (g) of this section.

(ii) [Reserved]

(2) *Screening subcategory testing (annual aggregate subcategory production volume equal to or greater than 1 million pounds, but less than 10 million pounds).* (i) The first representative test substance in subcategory I–A, identified as *n*-butyl glycidyl ether in paragraph (e)(2) of this section, shall be tested for subchronic neurotoxicity and developmental toxicity pursuant to paragraph (h) of this section. The second representative test substance in subcategory I–A, identified as tert-butyl glycidyl ether in paragraph (e)(2) of this section, shall be tested for subchronic toxicity pursuant to paragraph (h) of this section.

(ii) The representative test substance in subcategory I–C, identified in paragraph (e)(2) of this section, shall be tested for subchronic toxicity, subchronic neurotoxicity, and developmental toxicity pursuant to paragraph (h) of this section.

(iii) The representative test substance in subcategory II–A, identified in paragraph (e)(2) of this section, shall be tested for subchronic toxicity, subchronic neurotoxicity, and developmental toxicity pursuant to paragraph (h) of this section.

(iv) The representative test substance in subcategory III–A, identified in paragraph (e)(2) of this section, shall be tested for subchronic toxicity, subchronic neurotoxicity, and developmental toxicity pursuant to paragraph (h) of this section.

(v) The first representative test substance in subcategory IV–A, identified as *o*-cresyl glycidyl ether in paragraph (e)(2) of this section, shall be tested for subchronic toxicity, subchronic neurotoxicity, and developmental toxicity, pursuant to paragraph (h) of this section. The second representative test substance in subcategory IV–A, identified as phenyl glycidyl ether in paragraph (e)(2) of this section, shall be tested for subchronic neurotoxicity, pursuant to paragraph (h) of this section.

(vi) The representative test substance in subcategory V–B, identified in paragraph (e)(2) of this section, shall be tested for subchronic toxicity, subchronic neurotoxicity, developmental toxicity, and mutagenicity pursuant to paragraph (h) of this section.

(vii) The representative test substance in subcategory VII–A, identified in paragraph (e)(2) of this section, shall be tested for subchronic toxicity, subchronic neurotoxicity, developmental toxicity, and mutagenicity pursuant to paragraph (h) of this section.

(viii) Reserved.

(ix) The first representative test substance in subcategory VII–B, identified as glycidyl methacrylate in paragraph (e)(2) of this section, shall be tested for subchronic neurotoxicity and developmental toxicity pursuant to paragraph (h) of this section. The second representative test substance in subcategory VII–B, identified as glycidyl acrylate in paragraph (e)(2) of this section, shall be tested for subchronic toxicity pursuant to paragraph (h) of this section.

(3) *Health effects-specific testing*—(i) *Mutagenicity.* (A) Glycidol (CAS No. 556–52–5) shall be tested for mutagenicity according to paragraph (i) of this section except that paragraphs (i)(1)(i)(A), (i)(1)(i)(B), (i)(1)(i)(C), (i)(2)(i)(A), and (i)(2)(i)(B) of this section shall not apply.

(B) The representative test substance in subcategory I–A, identified in paragraph (e)(4) of this section, shall be tested for mutagenicity according to paragraph (i) of this section except that paragraphs (i)(1)(i)(A), (i)(1)(i)(B), (i)(2)(i)(A), and (i)(2)(i)(B) of this section shall not apply.

(C) The representative test substance in subcategory I–C, identified in paragraph (e)(4) of this section, shall be tested for mutagenicity according to paragraph (i) of this section except that paragraphs (i)(1)(i)(A), (i)(1)(i)(B), (i)(1)(i)(C), (i)(2)(i)(A), and (i)(2)(i)(B) of this section shall not apply.

(D) The representative test substance in subcategory I–D, identified in paragraph (e)(4) of this section, shall be tested for mutagenicity according to paragraph (i) of this section except that paragraph (i)(1)(i)(A) of this section shall not apply.

(E) The representative test substance in subcategory II–A, identified in paragraph (e)(4) of this section, shall be tested for mutagenicity according to paragraph (i) of this section except that paragraphs (i)(2)(i)(C) and (i)(2)(i)(D) of this section shall not apply.

(F) The representative test substance in subcategory III–A, identified in paragraph (e)(4) of this section, shall be tested for mutagenicity according to paragraph (i) of this section except that paragraphs (i)(1)(i)(A) and (i)(1)(i)(B) of this section shall not apply.

(G) The representative test substance in subcategory IV–A, identified in paragraph (e)(4) of this section, shall be tested for mutagenicity according to paragraph (i) of this section except that paragraphs (i)(1)(i)(A), (i)(1)(i)(B), and (i)(2)(i) of this section shall not apply.

(H) The representative test substance in subcategory V–A, identified in paragraph (e)(4) of this section, shall be tested for mutagenicity according to paragraph (i) of this section except that paragraphs (i)(1)(i)(A), (i)(1)(i)(B), (i)(1)(i)(C), (i)(2)(i)(A), and (i)(2)(i)(B) of this section shall not apply.

(I) The representative test substance in subcategory VI–C, identified in paragraph (e)(4) of this section, shall be tested for mutagenicity according to paragraph (i) of this section except that paragraphs (i)(1)(i)(A), (i)(1)(i)(B), (i)(1)(i)(C), (i)(2)(i)(A), and (i)(2)(i)(B) shall not apply.

(J) The representative test substance in subcategory VII–B, identified in paragraph (e)(4) of this section, shall be tested for mutagenicity according to paragraph (i) of this section except that paragraphs (i)(1)(i)(A), (i)(1)(i)(B), (i)(2)(i)(A), and (i)(2)(i)(B) of this section shall not apply.

(K) The representative test substance in subcategory VII–C, identified in paragraph (e)(4) of this section, shall be tested for mutagenicity according to paragraph (i) of this section except that paragraphs (i)(1)(i)(A), (i)(1)(i)(B), (i)(2)(i)(A), and (i)(2)(i)(B) of this section shall not apply.

(ii) *Subchronic toxicity.* The chemical substances identified in paragraph (d)(3)(i) of this section shall be tested for subchronic toxicity in accordance with paragraph (j) of this section.

(iii) *Reproductive and fertility effects.* The chemical substances identified in paragraph (d)(3)(i) of this section shall be tested for reproductive and fertility effects in accordance with paragraph (j) of this section.

(iv) *Neurotoxic effects.* (A) Glycidol (CAS No. 556–52–5) shall be tested for neurotoxic effects according to paragraph (j) of this section.

(B) *n*-Butyl glycidyl ether (CAS No. 2426–08–6) shall be tested for neurotoxic effects according to paragraph (k) of this section except for the subchronic testing pursuant to paragraphs (j)(3)(i)(A), (j)(3)(i)(B), and (j)(3)(i)(C) of this section.

(C) Allyl glycidyl ether (CAS No. 106–92–3) shall be tested for neurotoxic effects according to paragraph (j) of this section, except for the subchronic testing pursuant to paragraphs (j)(3)(i)(A), (j)(3)(i)(B), and (j)(3)(i)(C) of this section.

(D) 3-(Trimethoxysilyl)propyl glycidyl ether (CAS No.2530–83–8) shall be tested for neurotoxic effects according to paragraph (j) of this section except for the subchronic testing pursuant to paragraphs (j)(3)(i)(A), (j)(3)(i)(B), and (j)(3)(i)(C) of this section.

(E) Phenyl glycidyl ether (CAS No. 122–60–1) shall be tested for neurotoxic effects according to paragraph (j) of this section except for the subchronic testing pursuant to paragraphs (j)(3)(i)(A), (j)(3)(i)(B), and (j)(3)(i)(C) of this section.

(F) *o*-Cresyl glycidyl ether (CAS No. 2210–79–9) shall be tested for neurotoxic effects according to paragraph (j) of this section except for the subchronic testing pursuant to paragraphs (j)(3)(i)(A), (j)(3)(i)(B), and (j)(3)(i)(C) of this section.

(G) 1,4-Butanediol diglycidyl ether (CAS No. 2425–79–8) shall be tested for neurotoxic effects according to paragraph (j) of this section.

(g) *Test standards and reporting requirements for comprehensive subcategory testing*—(1) *Oncogenicity*—(i) *Required testing.* (A) When required under paragraph (d)(1)(i), an oncogenicity test shall be conducted with the substance identified in paragraph (e)(1) or (e)(3) in accordance with § 798.3300 of this chapter except for the provisions of paragraphs (b)(1)(i) and (b)(6)(i) of § 798.3300.

(B) For the purpose of this section, the following provisions also apply:

(*1*) *Animal selection.* Tests shall be conducted in both rats and mice.

(*2*) *Route of administration.* Animals shall be exposed to the test substance orally by gavage.

(ii) *Reporting requirements.* (A) The oncogenicity test required under paragraph (g)(1) of this section shall be completed and a final report submitted to EPA within 53 months after the effective date of this section or after the date of EPA's notification of manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(B) Interim progress reports shall be submitted to EPA at 6-month intervals beginning 6 months after the effective date of this section or after EPA's notification of manufacturers pursuant to paragraph (d)(1)(iii) of this section, until the final report is submitted to EPA.

(2) *Subchronic oral toxicity*—(i) *Required testing.* (A) When required under paragraph (d)(1)(i) of this section, subchronic oral toxicity testing shall be conducted with the test substance identified in paragraph (e)(1) or (e)(3) of this section in accordance with § 798.2650 of this chapter except for paragraphs (e)(1)(i) and (e)(7)(i) of § 798.2650.

(B) For the purpose of this section the following provisions also apply:

(*1*) *Animal selection.* Testing shall be conducted in both rats and mice.

(*2*) *Route of administration.* Animals shall be exposed to the test substance orally by gavage.

(ii) *Reporting requirements.* (A) The subchronic oral toxicity test shall be completed and the final report submitted to EPA within 12 months after the effective date of this section or within 12 months after EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(B) An interim progress report shall be submitted to EPA for the oral subchronic toxicity test 6 months after the effective date of this section or 6 months after EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(3) *Mutagenic effects—gene mutation*—(i) *Required testing.* (A) When required under paragraph (d)(1)(i) of this section, a test for gene mutation in *Salmonella typhimurium* (Ames test) shall be conducted with the test substance identified in paragraph (e)(1) or (e)(3) of this section in accordance with § 798.5265 of this chapter.

(B)(*1*) If a test substance produces a negative result in the assay conducted pursuant to paragraph (g)(3)(i)(A) of this section, a test for detection of gene mutation in somatic cells in culture shall be conducted with that test substance in accordance with § 798.5300 except for paragraph (d)(3)(i) of § 798.5300.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Cell line selection.* L5178Y mouse lymphoma cells shall be used for the test.

(*ii*) *Locus to be examined.* Mutations shall be measured at the thymidine kinase locus.

(C)(*1*) If a test substance produces a positive or equivocal result in the assay conducted pursuant to paragraph (g)(3)(i)(A) or in the assay conducted pursuant to paragraph (g)(3)(i)(B)(*1*) of this section, a sex-linked recessive lethal test in *Drosophila melanogaster* shall be conducted with that test substance in accordance with § 798.5275 of this chapter, except for the provisions of paragraph (d)(5)(iii) of § 798.5275.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Route of administration.* Exposure to the test substance shall be by the oral route.

(*ii*) [Reserved]

(D)(*1*) A test substance shall be tested in either the mouse visible specific locus assay (MVSL) or the mouse biochemical specific locus assay (MBSL), if that test substance exhibits a positive test result in the sex-linked recessive lethal assay conducted pursuant to paragraph (g)(3)(i)(C)(*1*) of this section, and if, after a review, EPA issues a Federal Register notice or sends a certified letter to the test sponsor specifying that the testing shall be initiated. The MVSL and MBSL shall be conducted in accordance with § 798.5200 of this chapter, except for the provisions of paragraph (d)(5)(iii) of § 798.5200 or with § 798.5195 of this chapter, except for the provisions of paragraph (d)(5)(iii) of § 798.5195, respectively.

(*2*) For the purpose of this section, the following provisions shall also apply:

(*i*) *Route of administration.* The test substance shall be administered to the test animals orally by gavage.

(*ii*) [Reserved]

(ii) *Reporting requirements.* (A)(*1*) The Ames test shall be completed and the final report submitted to EPA within 6 months after the effective date of this section or after the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(*2*) If required, the somatic cells in culture assay shall be completed and the final report submitted to EPA within 10 months after the effective date of this section or after the date of EPA's notification of manufacturers pursuant to paragraph (d)(1)(iii) of this section. An interim progress report shall be submitted within 6 months after the effective date of this section or after the date of EPA's notification of manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(*3*) If required, the *Drosophila* sex-linked recessive lethal assay shall be completed and the final report submitted to EPA within 22 months after the effective date of this section or after the date of EPA's notification of manufacturers pursuant to paragraph (d)(1)(iii) of this section. If required, an interim progress report shall be submitted within 16 months after the effective date of this section or after the date of EPA's notification of manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(*4*) If required, the MVSL or the MBSL shall be completed and the final report submitted to EPA within 51 months of the date of EPA's notification of the test sponsor by certified letter or Federal Register notice under paragraph (g)(3)(i)(D)(*1*) of this section that testing shall be initiated. Interim progress reports for the MVSL or MBSL, if required, shall be submitted to EPA at 6-month intervals, beginning 6 months after EPA's notification of the test sponsor that testing shall be initiated, until the applicable final report is submitted to EPA.

(4) *Mutagenic effects—chromosomal aberration*—(i) *Required testing.* (A)(*1*) When required under paragraph (d)(1)(i), an *in vitro* mammalian cytogenetics test shall be conducted with the test substance identified in paragraph (e)(1) or (e)(3) of this section in accordance with § 798.5375 of this chapter, except for the provisions of paragraph (d)(3) of § 798.5375.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Cell line.* Chinese hamster ovary cells shall be used for the assay.

(*ii*) [Reserved]

(B)(*1*) If a test substance produces a negative result in the *in vitro* cytogenetics test conducted pursuant to paragraph (g)(4)(i)(A)(*1*) of this section, an *in vivo* mammalian bone marrow cytogenetics test shall be conducted with that test substance in accordance with § 798.5385 of this chapter, except for the provisions of paragraphs (d)(3) and (d)(5)(iii) of § 798.5385.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal species.* The mouse shall be used for the test.

(*ii*) *Route of administration.* The test substance shall be administered orally by gavage.

(C)(*1*) If a test substance produces a positive or equivocal result in either the *in vitro* or the *in vivo* cytogenetics test conducted pursuant to paragraphs (g)(4)(i)(A)(1) or (g)(4)(i)(B)(*1*) of this section, a rodent dominant-lethal assay shall be conducted with that test substance in accordance with § 798.5450 of this chapter, except for the provisions of paragraphs (d)(3)(i) and (d)(5)(iii) of § 798.5450.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal selection.* Mice shall be used as the test species. Strains with low background dominant lethality, high frequency of pregnancy and high implant numbers are recommended.

(*ii*) *Route of administration.* The test substance shall be administered orally by gavage.

(D)(*1*) A rodent heritable translocation assay shall be conducted with a test substance if the dominant-lethal assay conducted for that test substance pursuant to paragraph (g)(4)(i)(C) of this section produces a positive result, and if, after a review, EPA issues a Federal Register notice or sends a certified letter to the test sponsor specifying that the testing shall be initiated. This test shall be conducted in accordance with § 798.5460 of this chapter except for the provisions of paragraphs (d)(3)(i) and (d)(5)(iii) of § 798.5460.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal selection.* Mice shall be used as the test species.

(*ii*) *Route of administration.* The test substance shall be administered orally by gavage.

(ii) *Reporting requirements. (A)(1)* The *in vitro* mammalian cytogenetics test shall be completed and the final report submitted to EPA within 10 months after the effective date of this section or after the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(*2*) If required, the *in vivo* mammalian bone-marrow cytogenetics test shall be completed and the final report submitted to EPA within 24 months after the effective date of this section or after EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(*3*) If required, the dominant-lethal assay shall be completed and the final report submitted to EPA within 36 months after the effective date of this section or after the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(*4*) If required, the heritable translocation assay shall be completed and the final report submitted to EPA within 25 months after the date of EPA's notification of the test sponsor under paragraph (g)(4)(i)(D)(*1*) of this section that testing shall be initiated.

(B) Interim progress reports shall be submitted to EPA at 6-month intervals beginning 6 months after initiation of the *in vitro* cytogenetics test and, if required, beginning 6 months after the initiation of the *in vivo* cytogenetics test, the rodent dominant lethal test, and the rodent heritable translocation test, until the applicable final reports are submitted to EPA.

(5) *Developmental toxicity*—(i) *Required testing.* (A) When required under paragraph (d)(1)(i) of this section, a developmental toxicity study shall be conducted with the test substance identified in paragraph (e)(1) or (e)(3) of this section in accordance with § 798.4900 of this chapter, except for the provisions of paragraphs (e)(1)(i) and (e)(5) of § 798.4900.

(B) For the purpose of this section, the following provisions also apply:

(*1*) *Animal selection.* Testing shall be performed in rats and mice. Commonly used laboratory strains shall be employed. The strain shall not have a

low fecundity and shall preferably be characterized for its sensitivity to developmental toxins.

(2) *Route of administration.* The test substance shall be administered to the test animals orally by gavage. The test substance shall be administered approximately the same time each day.

(ii) *Reporting requirements.* (A) The developmental toxicity study required under paragraph (g)(5)(i)(A) of this section shall be completed and a final report submitted to EPA within 12 months of the effective date of this section or after the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(B) An interim progress report shall be submitted to EPA 6 months after the effective date of this section or after the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(6) *Reproductive and fertility effects*—(i) *Required testing.* (A) When required under paragraph (d)(1)(i) of this section, a reproduction and fertility study shall be conducted with the test substance identified in paragraph (e)(1) or (e)(3) of this section in accordance with § 798.4700 of this chapter, except for the provisions of paragraphs (c)(1)(i), (c)(5)(i)(A) and (c)(5)(ii) of § 798.4700.

(B) For the purpose of this section, the following provisions also apply:

(*1*) *Animal selection.* The rat shall be the test species. Strains with low fecundity shall not be used.

(*2*) *Route of administration.* The test substance shall be administered to the test animals orally by gavage.

(ii) *Reporting requirements.* (A) The reproductive and fertility effects study required under paragraph (g)(6)(i)(A) of this section shall be completed and a final report submitted to EPA within 29 months of the effective date of this section or of the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(B) Interim progress reports shall be submitted to EPA at 6-month intervals, beginning 6 months after the effective date of this section or after the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section, until the final report is submitted to EPA.

(7) *Neurotoxicity*—(i) *Required testing.* (A)(*1*) When required under paragraph (d)(1)(i) of this section, an acute and subchronic functional observation battery shall be conducted with the test substance identified in paragraph (e)(1) or (e)(3) of this section in accordance with § 798.6050 of this chapter except for the provisions of paragraphs (d)(1)(i), (d)(5) and (d)(6) of § 798.6050.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal selection.* Testing shall be performed in laboratory rats. Standard strains should be used. The potential for combined studies should be considered.

(*ii*) *Duration of testing.* For the acute testing, the test substance shall be administered daily over a 5-day period; for the subchronic testing, test animals shall be exposed daily for at least 90 days.

(*iii*) *Route of administration.* Animals shall be exposed to the test substance orally by gavage.

(B)(*1*) When required under paragraph (d)(1)(i) of this section, an acute and subchronic motor activity test shall be conducted with the test substance identified in paragraph (e)(1) or (e)(3) of this section in accordance with § 798.6200 of this chapter except for the provisions of paragraphs (d)(1)(i), (d)(5) and (d)(6) of § 798.6200.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal selection.* Testing shall be performed in laboratory rats.

(*ii*) *Duration of testing.* For the acute testing, the test substance shall be administered daily over a 5-day period; for the subchronic testing, test animals shall be exposed daily for at least 90 days.

(*iii*) *Route of administration.* Test animals shall be exposed to the test substance orally by gavage.

(C)(*1*) When required under paragraph (d)(1)(i), a neuropathology test shall be conducted with the test substance identified in paragraphs (d) or (e) of this section in accordance with § 798.6400 of the chapter except for the provisions of paragraphs (d)(1)(i), (d)(5) and (d)(6) of § 798.6400.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal selection.* Testing shall be performed in laboratory rats.

(*ii*) *Duration of testing.* Animals shall be exposed for at least a 90-day period.

(*iii*) *Route of administration.* Animals shall be exposed to the test substance orally by gavage.

(ii) *Reporting requirements.* (A) The neurotoxicity tests required under paragraphs (g)(7)(i)(A), (g)(7)(i)(B), and (g)(7)(i)(C) of this section shall be completed and final reports submitted to EPA within 18 months of the effective date of this section or of the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section, until the final report is submitted to EPA.

(B) Interim progress reports for these neurotoxicity tests shall be submitted to EPA at 6-month intervals, beginning 6 months after the effective date of this section or of the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section, until the final report is submitted to EPA.

(h) *Required testing and reporting requirements for screening subcategory testing*—(1) *Subchronic oral toxicity*—(i) *Required testing.* (A) When required under paragraph (d)(1)(ii) of this section, subchronic oral toxicity testing shall be conducted with the test substance identified in paragraph (e)(2) or (e)(3) of this section in accordance with § 798.2650 of this chapter except for paragraphs (e)(1)(i) and (e)(7)(i) of § 798.2650.

(B) For the purpose of this section the following provisions also apply:

(*1*) *Animal selection.* Testing shall be conducted in rats.

(*2*) *Route of administration.* Animals shall be exposed to the test substance orally by gavage.

(ii) *Reporting requirements.* (A) The subchronic oral toxicity test shall be completed and the final report submitted to EPA within 12 months after the effective date of this section or after EPA's notification of manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(B) An interim progress report shall be submitted to EPA for the oral subchronic toxicity test at 6 months after the effective date of this section or after EPA's notification of manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(2) *Mutagenic effects—gene mutation*—(i) *Required testing*—(A) When required under paragraph (d)(1)(ii) of this section, a test for gene mutation in *Salmonella typhimurium* (Ames test) shall be conducted with the test substance identified in paragraph (e)(2) or (e)(3) of this section in accordance with § 798.5265 of this chapter.

(B)(*1*) When required under paragraph (d)(1)(ii) of this section, a test for detection of gene mutation in somatic cells in culture shall be conducted with the test substance identified in paragraph (e)(2) of this section in accordance with § 798.5300 except for paragraph (d)(3)(i) of § 798.5300.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Cell line selection.* L5178Y mouse lymphoma cells shall be used for the test.

(*ii*) *Locus to be examined.* Mutations shall be measured at the thymidine kinase locus

(ii) *Reporting requirements.* (A)(*1*) The Ames test shall be completed and the final report submitted to EPA within 6 months after the effective date of this section or after the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(*2*) The somatic cells in culture assay shall be completed and the final report submitted to EPA within 10 months after the effective date of this section or after the date of EPA's notification of manufacturers pursuant to paragraph (d)(1)(iii) of this section. An interim progress report shall be submitted within 6 months after the effective date of this section or after the date of EPA's notification of manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(3) *Mutagenic effects—chromosomal aberration*—(i) *Required testing.* (A)(*1*) When required under paragraph (d)(1)(ii) of this section, an *in vitro* mammalian cytogenetics test shall be conducted with the test substance identified in paragraph (e)(2) or (e)(3) of this section in accordance with § 798.5375 of this chapter, except for the provisions of paragraph (d)(3) of § 798.5375.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Cell line.* Chinese hamster ovary cells shall be used for the assay.

(*ii*) [Reserved]

(B)(*1*) When required under paragraph (d)(1)(ii) of this section, an *in vivo* mammalian bone marrow cytogenetics test shall be conducted with the test substance identified in paragraph (e)(2) of this section in accordance with § 798.5385 of this chapter, except for the provisions of paragraphs (d)(3) and (d)(5)(iii) of § 798.5385.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal species.* The mouse shall be used for the test.

(*ii*) *Route of administration.* The test substance shall be administered orally by gavage.

(ii) *Reporting requirements.* (A)(*1*) The *in vitro* mammalian cytogenetics test shall be completed and the final report submitted to EPA within 10 months after the effective date of this section or after the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(*2*) The *in vivo* mammalian bone-marrow cytogenetics test shall be completed and the final report submitted to EPA within 24 months after the effective date of this section or after EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(B) Interim progress reports shall be submitted to EPA at 6-month intervals beginning 6 months after the effective date of this section or after the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(4) *Developmental toxicity*—(i) *Required testing.* (A)(*1*) When required under paragraph (d)(1)(ii) of this section, the test substance listed in paragraph (e)(2) or (e)(3) of this section shall be tested in the preliminary developmental toxicity screen in accordance with § 798.4420 of this chapter, except for the provisions of paragraphs (d)(1)(i) and (d)(5) of § 798.4420.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal species.* Rats shall be used for the test. The strain should be commonly used and should not have low fecundity.

(*ii*) *Route of administration.* The test substance shall be administered orally by gavage.

(B) [Reserved]

(ii) *Reporting requirements.* (A) The preliminary developmental toxicity screen shall be completed and the final report submitted to EPA within 12 months of the effective date of this section or of the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(B) An interim progress report shall be submitted to EPA 6 months after the effective date of this section or after the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(5) *Neurotoxicity*—(i) *Required testing.* (A)(*1*) When required under paragraph (d)(1)(ii) of this section, a subchronic functional observation battery shall be conducted with the test substance identified in paragraph (e)(2) or (e)(3) of this section in accordance with § 798.6050 of this chapter except for the provisions of paragraphs (d)(1)(i), (d)(5) and (d)(6) of § 798.6050.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal selection.* Testing shall be performed in laboratory rats. Standard strains should be used. The potential for combined studies should be considered.

(*ii*) *Duration of testing.* Test animals shall be exposed daily for at least 90 days.

(iii) *Route of administration.* Animals shall be exposed to the test substance orally by gavage.

(B)(*1*) When required under section (d)(1)(ii), a subchronic motor activity test shall be conducted with the test substance identified in paragraph (e)(2) or (e)(3) of this section in accordance with § 798.6200 of this chapter except for the provisions of paragraphs (d)(1)(i), (d)(5) and (d)(6) of § 798.6200.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal selection.* Testing shall be performed in laboratory rats.

(*ii*) *Duration of testing.* Test animals shall be exposed daily for at least 90 days.

(*iii*) *Route of administration.* Test animals shall be exposed to the test substance orally by gavage.

(C)(*1*) When required under paragraph (d)(1)(ii) of this section, a neuropathology test shall be conducted with the test substance identified in paragraph (e)(2) or (e)(3) of this section in accordance with § 798.6400 of the chapter except for the provisions of paragraphs (d)(1)(i), (d)(5) and (d)(6) of § 798.6400.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal selection.* Testing shall be performed in laboratory rats.

(*ii*) *Duration of testing.* Animals shall be exposed for at least a 90-day period.

(*iii*) *Route of administration.* Animals shall be exposed to the test substance orally by gavage.

(ii) *Reporting requirements.* (A) The neurotoxicity tests required under paragraphs (h)(5)(i)(A), (h)(5)(i)(B), and (h)(5)(i)(C) of this section shall be completed and final reports submitted to EPA within 18 months of the effective date of this section or of the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section.

(B) Interim progress reports for these neurotoxicity tests shall be submitted to EPA at 6-month intervals, beginning at 6 months after the effective date of this section or of the date of EPA's notification of the manufacturers pursuant to paragraph (d)(1)(iii) of this section, until the final report is submitted to EPA.

(i) *Required testing and reporting requirements for health effect-specific subcategory mutagenic effects testing*—(1) *Gene mutation*—(i) *Required testing.* (A) When required under paragraph (d)(2)(i) of this section, a test for gene mutation in *Salmonella typhimurium* (Ames test) shall be conducted with the test substance identified in paragraph (e)(4) of this section in accordance with § 798.5265 of this chapter.

(B)(*1*) If a test substance produces a negative result in the assay conducted pursuant to paragraph (i)(1)(i)(A) of this section, a test for detection of gene mutation in somatic cells in culture shall be conducted with that test substance in

accordance with § 798.5300 except for paragraph (d)(3)(i) of § 798.5300.

(2) For the purpose of this section, the following provisions also apply:

(i) *Cell line selection.* L5178Y mouse lymphoma cells shall be used for the test.

(ii) *Locus to be examined.* Mutations shall be measured at the thymidine kinase locus.

(C)(1) If a test substance produces a positive or equivocal result in the assay conducted pursuant to paragraph (i)(1)(i)(A) or in the assay conducted pursuant to paragraph (i)(1)(i)(B) of this section, a sex-linked recessive lethal test in *Drosophila melanogoster* shall be conducted with that test substance in accordance with § 798.5275 of this chapter, except for the provisions of paragraph (d)(5)(iii) of § 798.5275.

(2) For the purpose of this section, the following provisions also apply:

(i) *Route of administration.* Exposure to the test substance shall be by the oral route.

(ii) [Reserved]

(D)(1) A test substance shall be tested in either the MVSL or the MBSL, if that test substance exhibits a positive test result in the sex-linked recessive lethal assay conducted pursuant to paragraph (i)(1)(i)(C) of this section, and if, after a review, EPA issues a Federal Register notice or sends a certified letter to the test sponsor specifying that the testing shall be initiated. The MVSL and MBSL shall be conducted in accordance with § 798.5200 of this chapter, except for the provisions of paragraph (d)(5)(iii) of § 798.5200 or with § 798.5195 of this chapter, except for the provisions of paragraph (d)(5)(iii) of § 798.5195, respectively.

(2) For the purpose of this section, the following provisions shall also apply:

(i) *Route of administration.* The test substance shall be administered to the test animals orally by gavage.

(ii) [Reserved]

(ii) *Reporting requirements.* (A)(1) The Ames test shall be completed and the final report submitted to EPA within 6 months after the effective date of this section.

(2) If required, the somatic cells in culture assay shall be completed and the final report submitted to EPA within 10 months after the effective date of this section. An interim progress report shall be submitted within 6 months after the effective date of the final rule.

(3) If required, the *Drosophila* sex-linked recessive lethal assay shall be completed and the final report submitted to EPA within 22 months after the effective date of this section. If required, an interim progress report shall be submitted within 16 months after the effective date of the final rule.

(4) If required, the MVSL test or the MBSL shall be completed and the final report submitted to EPA within 51 months of the date of EPA's notification of the test sponsor by certified letter or Federal Register notice under paragraph (i)(1)(i)(D) of this section that testing shall be initiated. Interim progress reports for the MVSL or MBSL test, if required, shall be submitted to EPA at 6-month intervals, beginning at 6 months after EPA's notification of the test sponsor that testing shall be initiated, until the applicable final report is submitted to EPA.

(2) *Chromosomal aberration*—(i) *Required testing.* (A)(1) When required under paragraph (d)(2)(i) of this section, an *in vitro* mammalian cytogenetics test shall be conducted with the test substance identified in paragraph (e)(4) of this section in accordance with § 798.5375 of this chapter, except for the provisions of paragraph (d)(3) of § 798.5375.

(2) For the purpose of this section, the following provisions also apply:

(i) *Cell line.* Chinese hamster ovary cells shall be used for the assay.

(ii) [Reserved]

(B)(1) If a test substance produces a negative result in the *in vitro* cytogenetics test conducted pursuant to paragraph (i)(2)(i)(A) of this section, an *in vivo* mammalian bone marrow cytogenetics test shall be conducted with that test substance in accordance with § 798.5385 of this chapter, except for the provisions of paragraphs (d)(3) and (d)(5)(iii) of § 798.5385.

(2) For the purpose of this section, the following provisions also apply:

(i) *Animal species.* The mouse shall be used for the test.

(ii) *Route of administration.* The test substance shall be administered orally by gavage.

(C)(1) If a test substance produces a positive or equivocal result in either the *in vitro* or the *in vivo* cytogenetics test conducted pursuant to paragraphs (i)(2)(i)(A) or (i)(2)(i)(B) of this section, a rodent dominant-lethal assay shall be conducted with that test substance in accordance with § 798.5450 of this chapter, except for the provisions of paragraphs (d)(3)(i) and (d)(5)(iii) of § 798.5450.

(2) For the purpose of this section, the following provisions also apply:

(i) *Animal selection.* Mice shall be used as the test species. Strains with low background dominant lethality, high frequency of pregnancy and high implant numbers are recommended.

(ii) *Route of administration.* The test substance shall be administered orally by gavage.

(D)(1) A rodent heritable translocation assay shall be conducted with the test substance if the dominant-lethal assay conducted for the test substance pursuant to paragraph (i)(2)(i)(A) of this section produces a positive result, and if, after a review, EPA issues a Federal Register notice or sends a certified letter to the test sponsor specifying that the testing shall be initiated. This test shall be conducted in accordance with § 798.5460 of this chapter except for the provisions of paragraphs (d)(3)(i) and (d)(5)(iii) of § 798.5460.

(2) For the purpose of this section, the following provisions also apply:

(i) *Animal selection.* Mice shall be used as the test species.

(ii) *Route of administration.* The test substance shall be administered orally by gavage.

(ii) *Reporting requirements.* (A)(1) The *in vitro* mammalian cytogenetics test shall be completed and the final report submitted to EPA within 10 months after the effective date of this section.

(2) If required, the *in vivo* mammalian bone-marrow cytogenetics test shall be completed and the final report submitted to EPA within 24 months after the effective date of this section.

(3) If required, the dominant-lethal assay shall be completed and the final report submitted to EPA within 36 months after the effective date of this section.

(4) If required, the heritable translocation assay shall be completed and the final report submitted to EPA within 25 months after the date of EPA's notification of the test sponsor under paragraph (i)(2)(i)(D) of this section that testing shall be initiated.

(B) Interim progress reports shall be submitted to EPA at 6-month intervals beginning 6 months after initiation of the *in vitro* cytogenetics test and, as applicable, beginning 6 months after the initiation of the *in vivo* cytogenetics test, the rodent dominant lethal test, and the rodent heritable translocation test, until the applicable final reports are submitted to EPA.

(j) *Required testing and reporting requirements for health effect-specific testing of specific substances*—(1) *Subchronic toxicity*—(i) *Required testing.* (A) When required under paragraph (d)(3)(i) of this section, subchronic oral toxicity testing shall be conducted with the test substance identified in paragraph (d)(3)(i) of this section in accordance with § 798.2650 of this chapter except for paragraphs (e)(1)(i) and (e)(7)(i) of § 798.2650.

(B) For the purpose of paragraph (j)(1)(i)(A) of this section the following provisions also apply:

(*1*) *Animal selection.* Testing shall be conducted in both rats and mice.

(*2*) *Route of administration.* Animals shall be exposed to the test substance orally by gavage.

(ii) *Reporting requirements.* (A) The subchronic oral toxicity test shall be completed and the final report submitted to EPA within 12 months after the effective date of this section.

(B) An interim progress report shall be submitted to EPA for the oral subchronic toxicity test at 6 months after the effective date of this section.

(2) *Reproductive and fertility effects*—(i) *Required testing.* (A) When required under paragraph (d)(3)(i) of this section, a reproduction and fertility study shall be conducted with the test substance identified in paragraph (d)(3)(i) of this section in accordance with § 798.4700 of this chapter, except for the provisions of paragraphs (c)(1)(i), (c)(5)(i)(A) and (c)(5)(ii) of § 798.4700.

(B) For the purpose of this section, the following provisions also apply:

(*1*) *Animal selection.* The rat shall be the test species. Strains with low fecundity shall not be used.

(*2*) *Route of administration.* The test substance shall be administered to the test animals orally by gavage.

(ii) *Reporting requirements.* (A) The reproductive and fertility effects study required under paragraph (j)(2)(i)(A) of this section shall be completed and a final report submitted to EPA within 29 months of the effective date of this section.

(B) Interim progress reports shall be submitted to EPA at 6-month intervals, beginning 6 months after the effective date of this section.

(3) *Neurotoxicity*—(i) *Required testing.* (A)(*1*) When required under paragraph (d)(3)(i) of this section, an acute and subchronic functional observation battery shall be conducted with the test substance identified in paragraph (d)(3)(i) of this section in accordance with § 798.6050 of this chapter except for the provisions of paragraphs (d)(1)(i), (d)(5) and (d)(6) of § 798.6050.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal selection.* Testing shall be performed in laboratory rats. Standard strains should be used. The potential for combined studies should be considered.

(*ii*) *Duration of testing.* For the acute testing, the test substance shall be administered daily over a 5-day period; for the subchronic testing, test animals shall be exposed daily for at least 90 days.

(*iii*) *Route of administration.* Animals shall be exposed to the test substance orally by gavage.

(B)(*1*) When required under paragraph (d)(3)(i) of this section, an acute and subchronic motor activity test shall be conducted with the test substance identified in paragraph (d)(3)(i) of this section in accordance with § 798.6200 of this chapter except for the provisions of paragraphs (d)(1)(i), (d)(5) and (d)(6) of § 798.6200.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal selection.* Testing shall be performed in laboratory rats.

(*ii*) *Duration of testing.* For the acute testing, the test substance shall be administered daily over a 5-day period; for the subchronic testing, test animals shall be exposed daily for at least 90 days.

(*iii*) *Route of administration.* Test animals shall be exposed to the test substance orally by gavage.

(C)(*1*) When required under paragraph (d)(3)(i) of this section, a neuropathology test shall be conducted with the test substance identified in paragraph (d)(3)(i) of this section in accordance with § 798.6400 of the chapter except for the provisions of paragraphs (d)(1)(i), (d)(5) and (d)(6) of § 798.6400.

(*2*) For the purpose of this section, the following provisions also apply:

(*i*) *Animal selection.* Testing shall be performed in laboratory rats.

(ii) *Duration of testing.* Animals shall be exposed for at least a 90-day period.

(iii) *Route of administration.* Animals shall be exposed to the test substance orally by gavage.

(ii) *Reporting requirements.* (A) The neurotoxicity tests required under paragraphs (j)(3)(i)(A), (j)(3)(i)(B), and (j)(3)(i)(C) of this section shall be completed and final reports submitted to EPA within 18 months of the effective date of this section.

(B) Interim progress reports for these neurotoxicity tests shall be submitted to EPA at 6-month intervals, beginning at 6 months after (the effective date of this section) until the final report is submitted to EPA.

VI. Issues For Comment

A. Route of Exposure for Proposed Testing

This proposed rule specifies the TSCA health effects test guidelines and the oral route of exposure for all whole-animal testing required for members of the chemical category of glycidyls. EPA is proposing that gavage administration be used for the following types of studies: oncogenicity, subchronic (90-day) toxicity, *in vivo* cytogenetics, dominant lethal, heritable translocation, mouse visible or biochemical specific locus, developmental toxicity, reproductive toxicity, and Chernoff screening test for reproductive toxicity.

Although EPA believes that most human exposure to these substances will occur by the dermal and/or inhalation routes, EPA has proposed the oral route for testing for the following reasons. Meaningful dermal studies may be difficult, if not impossible, to conduct because of the general properties of irritancy to skin and the ability to elicit skin sensitization reactions demonstrated by many members of this chemical category. Most of the proposed test substances have low vapor pressures, making inhalation studies difficult, if not impossible, to conduct and quantitation of actual dose levels less accurate than possible in oral studies. EPA solicits comments on the proposed routes of exposure for all whole-animal testing under this rule.

B. Subchronic/Oncogenicity Testing

Many of the subchronic studies conducted as range-finding, dose-setting studies for oncogenicity bioassays submitted to EPA have been deficient in evaluation of several important longer-term health effects. Because EPA is interested in a more comprehensive evaluation of these effects, EPA has proposed that the test standard for proposed oncogenicity testing of the glycidyls consist of oncogenicity bioassays by gavage, conducted according to 40 CFR 798.3300, and subchronic toxicity testing by gavage, conducted according to 40 CFR 798.2650. Alternatively, EPA has considered proposing the TSCA health effect eesting guideline for combined chronic toxicity/oncogenicity (40 CFR 798.3320), using administration by gavage, as the test standard. EPA solicits public comment on the relative merits of these two approaches.

C. Mutagenicity Testing

The current mutagenicity testing scheme used in TSCA section 4(a) test rules and proposed in modified form for this chemical category is outlined in Unit V.B.2. of this preamble. Revisions to this testing scheme are under review within EPA. Specifically, consideration is being given to eliminating the requirement for the *in vitro* mammalian cytogenetics test (40 CFR 798.5375), and eliminating all triggers in the first tier of tests. This would result in a requirement for three tests in the first tier (Ames assay, 40 CFR 798.5265; mammalian cells in culture test for gene mutation, 40 CFR 798.5300; and an *in vivo* assay for

chromosomal aberrations, 40 CFR 798.5385, or an *in vivo* assay for micronuclei, 40 CFR 798.5395). There would be no triggering of tests within the first tier; EPA would review the data from all three tests to determine whether one or both of the second-tier tests (sex-linked recessive lethal test in *Drosophila*, 40 CFR 798.5275 or other test(s), as appropriate, and rodent dominant lethal test, 40 CFR 798.5450) should be initiated.

The same EPA reviews of the data obtained from the second-tier tests described in Unit V.B.2. of this preamble would determine if further oncogenicity or mutagenicity testing, respectively, would be required.

EPA solicits public comment on the relative merits of the mutagenicity testing scheme proposed for this chemical category and its contemplated revision.

D. Developmental Toxicity Testing

As discussed in Unit V.B.3. of this preamble, EPA has proposed the Chernoff screening test (40 CFR 798.4420) for representative test substances from subcategories with testing triggered when annual production volume exceeds 1 million pounds, but is less than 10 million pounds. By contrast, EPA has proposed to require developmental toxicity testing in two species using the developmental toxicity study (40 CFR 798.4900) for substances for which testing is proposed based on preliminary hazard data and for a representative member of any subcategory whose annual production volume equals or exceeds 10 million pounds.

EPA is considering replacing the proposed Chernoff screening test (40 CFR 798.4420) requirement with a requirement for testing with one species in the complete developmental toxicity study (40 CFR 798.4900). EPA believes that such a one-species test may prove more effective for screening purposes than the proposed Chernoff test, and invites public comment on the relative merits of these two screening approaches.

E. Additional Existing Test Data

As discussed in Unit II.F. of this preamble, EPA has reviewed (Refs. 2 and 3) all of the health effects data for the members of the chemical category of glycidyls available to EPA at the time of rule development. Included in this review were studies submitted to EPA by industry under section 8(d) or (e) of TSCA, studies submitted to EPA on a voluntary basis, and studies appearing in the open scientific literature. In many cases, EPA was unable to evaluate studies because the nature of the test substance was not adequately characterized. EPA solicits the submission of any additional health effects studies not included in this preamble or contained in References 2 or 3, together with an adequate description of the test substance. Such a description should include the percent purity established by a cited analytical procedure, the identity of any major impurities established by cited methodologies, an estimate of the average molecular weight of the test substance and methods used for estimation, and the Chemical Abstracts Service Registry Number (CAS No.) for the test substance. This information will be used by EPA to determine whether adequate data already exist to meet some of the testing requirements proposed here.

F. Future Testing of Oligomers and Polymers

This proposal deals only with test requirements for monomeric members of the chemical class of glycidyls. EPA believes that any toxicity elicited as a result of exposure to high molecular weight polymers would primarily be due to the action of residual monomers and oligomers because of the expected poor absorption of higher molecular weight species. This assumption has yet to be verified for this chemical class. Further examination of this assumption is important given that the human exposure to liquid epoxy resins containing oligomers and polymers far exceeds exposure to monomers. In addition, many of the new chemical substances for which Premanufacture Notices (PMN's) have been submitted to EPA under section 5 of TSCA are oligomers or polymers of the glycidyls, and data are lacking for existing oligomers and polymers of this class for use as analogue data for new substances under PMN review.

If the criteria for TSCA section 4 testing for glycidyls were based solely on data needs for the Premanufacture Review program, bisphenol A diglycidyl ether and its derivatives would represent the highest priority candidates for testing. Glycidyl acrylate (or methacrylate) would represent the second priority candidates. The TSCA section 5 data needs for health effects testing of bisphenol A diglycidyl ether are consistent with the testing scheme outlined in this proposed rule.

In performing risk assessments for regulatory decision-making under section 5 of TSCA, and in evaluating the safety of existing substances that are made by polymerization and may contain significant quantities of low-molecular-weight, but non-monomeric species, it is crucial to develop an understanding of the relationships between toxicity, molecular weight, and absorption potential of oligomeric and polymeric species.

In light of data needs for the evaluation of both new and existing substances which are oligomeric or polymeric in nature, EPA is interested in evaluating health effects test data submitted by industry on oligomeric glycidyl compounds that are well characterized with respect to molecular weight distribution, epoxy equivalent weight, and purity.

EPA believes that the oligomeric substances of greatest interest for testing would include the homopolymers of bisphenol A diglycidyl ether. For example, with respect to oncogenicity testing, a lifetime cancer bioassay might be conducted in two species by an appropriate route of exposure simultaneously with a pure monomeric glycidyl compound and two or three molecular weight ranges of the homopolymer of that monomer. Alternatively, it might be possible to conduct "limited" lifetime cancer bioassays to screen for potential oncogenicity for such a series of glycidyl compounds. Such bioassays would be "limited" in the sense that only one sex and one species of rodent might be used for such screening purposes. While such an approach would not provide a definite measure of oncogenic potential, it would allow for a relative estimate when the data from each glycidyl oligomer tested were compared with the effects elicited by other oligomers of the same monomer.

EPA recognizes that obtaining pure dimer, trimer, etc., of a glycidyl monomer might be difficult. However, if several molecular weight ranges of the substance were prepared, and the percentages of individual species in each sample were determined by gel permeation chromatography, for example, EPA believes that results of toxicity studies on such materials would be meaningful.

EPA solicits comment on the feasibility of such an approach for future rulemaking under section 4 of TSCA for oligomers and polymers of the chemical category of glycidol and its derivatives, and requests suggestions for alternative approaches. EPA also requests comment on the suitability of a testing Consent Order under TSCA section 4 as the method of choice for obtaining test data on these oligomers and polymers, and welcomes the current or future submission of any such test data

G. Representative Test Substance

In this proposal, EPA has attempted to balance testing needs with the cost of testing. Therefore, EPA has lessened testing requirements in some instances by specifying one substance within a subcategory as the test substance to fulfill testing requirements. EPA solicits comments on whether instead of this approach, EPA should allow a manufacturer who does not make the substance specified for testing to opt out of joint testing if that manufacturer conducts testing of the substance the manufacturer makes. The other manufacturers would still be required to conduct joint testing of the representative test substance designated by EPA.

H. Production Volume Triggers for Subcategory Testing

As discussed in Unit III. of this preamble, EPA is proposing to use the annual production data submitted under the proposed TSCA section 8(a) rule for glycidyls to trigger testing of a representative member of a subcategory in either a screening battery or comprehensive battery of tests, which are described in Unit V.A. EPA has proposed using the aggregate annual production volume of the subcategory as the criterion, with subcategories having an aggregate annual production volume of at least 1 million pounds but less than 10 million pounds required to test a representative member in the screening battery, and subcategories having an aggregate annual production volume of 10 million pounds or more required to test a representative member in the comprehensive battery.

EPA has considered using other criteria to trigger subcategory testing. Using the additive production/importation volumes of subcategory members as the only triggering criterion might conceivably result in the triggering of testing of a subcategory containing a great number of members whose aggregate production reached the triggering value, but for which the production volumes of the individual members would be quite low. EPA, therefore, considered an alternative criterion for triggering testing based not on aggregate subcategory production volume but rather on average annual production volume for subcategory members. Rather than a single criterion of aggregate annual subcategory production of at least one million pounds but less than 10 million pounds for triggering the screening battery of testing, the condition to be met might be that the average subcategory member production volume (aggregate subcategory production volume divided by the number of subcategory members) must be greater than a minimum value (for example, the average value could be set at 1 million pounds). Similarly, the criterion for the triggering of comprehensive testing would consist of an average subcategory member production volume reaching a minimum value (for example, the average value could be set at 10 million pounds).

EPA invites comments on the relative merits of these two approaches for triggering of subcategory testing.

EPA also welcomes comments on the following, as well as suggestions for other triggering criteria:

1. Triggering testing for a subcategory if at least one representative of the subcategory totals 1 million pounds of production per year.

2. Triggering testing for a subcategory by means of exposure-based criteria such as workers exposed, consumers exposed, etc., in addition to production-based criteria.

I. Comprehensive Testing Trigger

EPA has defined two production-level triggers, one at one million pounds for screening level testing and one at 10 million pounds for oncogenicity and comprehensive level testing. EPA solicits comment on whether 10 million pounds comports with manufacturers' ability to pay for the comprehensive level of testing. In addition, EPA solicits comments on the value of the information derived from comprehensive testing relative to the burden imposed when selecting this trigger. Is it appropriate to use 10 million pounds to trigger testing based on a high production/high exposure concern? If an exposure value should be included, what should it be and how could EPA apply it as a triggering mechanism?

J. Interchangeability of Substances for End Uses

EPA is aware of the interchangeability of several of the glycidyls for the same end use, and has considered the available data regarding this interchangeability in EPA's economic analysis of this proposed rule presented in Unit VII. of the preamble.

To gain a greater understanding of the interchangeability of glycidyls, so that this factor can play the appropriate role in evaluations of the economic impact of this proposed rule, EPA is requesting the submission of additional data relating to interchangeability.

K. Subcategorization Scheme

EPA has attempted to balance the costs of testing with the need to conduct risk assessments on these chemicals. Accordingly, to ease the testing costs, EPA has not proposed testing of each member of the category. Instead, EPA has used SAR to define subcategories and has proposed that, generally, data be developed on only one member of a particular subcategory. This would be sufficient testing, however, because wherever possible, EPA would use the data on the tested member to assess the risks of all members of the subcategory. EPA has considered alternatives, such as using fewer subcategories, which would further lessen the burden of testing. However, using fewer subcategories would also mean that the substances within each subcategory would be less structurally similar, and therefore using the data on one test substance to represent the toxicity of all members of the subcategory would become more difficult to justify. While EPA has tried to accommodate these two objectives, EPA recognizes that there may be other workable approaches. Therefore, EPA is interested in constructive suggestions of how to reduce the testing burden and reduce the complexity of this rule, while providing for sufficient data to assess the risks posed by the entire category of glycidyls. EPA is soliciting comment on alternative subcategorizations based on testing burden and the usefulness of the test data.

VII. Economic Analysis of Proposed Rule

To assess the potential economic impact of this rule, EPA has prepared an economic analysis that evaluates the potential for significant adverse economic impacts on the industry as a result of the required testing. Much of the information reviewed in the economic analysis was claimed as Confidential Business Information (CBI) and, although in the record for this rulemaking as TSCA CBI Document Control No.: 20-811000066, is not available for public review. A non-CBI version of this analysis has been prepared (Ref. 14) and has been placed in the public rulemaking record for this proposed rule. The analysis is summarized below.

The total costs of the proposed immediately-required testing are estimated to range from $12.9 to $16.2 million, including $10.3 to $14.6 million in laboratory costs and $2.6 to $3.6 million in administrative costs. Administrative cost associated with test rules are estimated to be equal to 25 percent of the laboratory costs, and account for activities such as selecting laboratories, preparing test protocols, monitoring testing, developing cost-

sharing agreements and preparing reports to EPA. The annualized test costs (using a 7 percent cost of capital and a 15–year cost recovery period) range from $1.4 million to $2.0 million. Annualized costs represent the constant costs which would have to be recouped each year of the 15–year payback period to finance the testing expenditure in the first year. The annualized costs are compared with annual revenue as an indication of the potential impact of the test costs.

To simplify discussion of the test cost impacts, the substances included in this proposed rule have been divided into three different groups, based on the uses of the substances. The potential impact of the test costs on each of these three groups, and on glycidol, is discussed below.

A. Epoxy Resin Intermediate and Specialty Resins

This group includes the substances in subcategories VI and VII. Diglycidyl ether of bisphenol A, an intermediate to epoxy resins, is by far the largest volume substance in this group. The others in this group are used as epoxy modifiers, as specialty resins for aerospace applications, and as intermediates to components of acrylic coating resins.

Total estimated test costs for this group of chemicals range from $4.6 million to $6.5 million. The potential for adverse economic impact on the substances in this group appears to be low, due to the following factors: demand appears to be inelastic; market expectations are favorable; and unit test costs are low relative to price.

B. Reactive Diluents

Subcategories I, II, IV, and V are comprised primarily of glycidyl ethers which are used as reactive diluents for epoxy resins. Estimated total test costs for this group range from $6.2 million to $8.8 million. The potential for significant adverse economic impact of the test costs on the group of reactive diluents as a whole appears to be low. However, the potential for adverse economic impact on some of the lower-volume reactive diluents in the group may be significant. These conclusions are based on the following factors: demand for reactive diluents as a group appears to be relatively inelastic, but demand for some of the low-volume diluents may be significantly more elastic; and unit test costs may be somewhat high relative to price for several of the individual chemicals in the group. The adverse impacts of any potential substitutions are also reduced by the likelihood that the suppliers of the potentially affected chemicals are also the suppliers of the probable substitutes.

C. Silane Coupling Agents

The only substance of commercial significance in subcategory III is 3-(trimethoxysilyl)propyl glycidyl ether, which is used as a silane coupling agent. Estimated total test costs for this category range from $1.1 million to $1.5 million. These costs are not expected to have a significant economic impact, due to the following factors: demand for 3-(trimethoxysilyl)propyl glycidyl ether appears to be somewhat inelastic; market expectations are favorable; and test costs are low relative to price. The adverse impacts of any potential substitutions are also reduced by the likelihood that the several suppliers of 3-(trimethoxysilyl)propyl glycidyl ether are also suppliers of the probable substitutes.

D. Glycidol

Estimated total test costs for glycidol range from $0.9 million to $1.3 million. The potential for significant impact on the glycidol market is low, because demand for this substance appears to be inelastic.

Refer to the non-CBI economic analysis found in the rulemaking record for this proposed rule for a complete discussion of test costs estimation and the potential for economic impact resulting from these tests.

E. Costs of Reporting Under TSCA Section 8(a)

In addition to the costs of testing, firms will also incur costs for reporting under TSCA section 8(a). Firms will be required to report their annual production volume of each substance subject to the test rule. This requirement represents an additional expense for each of those years in which firms are not required to report production volumes under the Inventory Update Rule, which requires reporting every fourth year. Each year's reporting will cost approximately $35 per substance per firm, involving 0.5 hours of technical time, 0.5 hours of clerical time, and 0.2 hours of management staff per chemical per company. Additionally, each firm may incur fixed costs of $50 annually as 1 hour of management time is spent for rule familiarization. Section 8(a) reporting costs have no effect on the conclusions discussed above concerning the potential for adverse economic impact on any of the substances subject to this rule.

VIII. Availability of Test Facilities And Personnel

EPA has determined that test facilities and personnel are available to perform the testing specified in this proposed rule (Ref. 15).

IX. Public Meetings

If persons indicate to EPA that they wish to present oral comments on this proposed rule to EPA officials who are directly responsible for developing the rule and supporting analyses, EPA will hold a public meeting subsequent to the close of the public comment period in Washington, DC. Persons who wish to attend or to present comments at the meeting should call Mary Louise Hewlett (202) 260–8162. The meeting will be open to the public, but active participation may be limited to those persons who arrange to present comments and to designated EPA participants. participants are requested to submit copies of their statements by the meeting date. These statements and a transcript of the meeting will become part of the record for this rulemaking.

X. Comments Containing Confidential Business Information (CBI)

All comments will be placed in the public file unless they are clearly labeled as CBI when they are submitted. While part of the record, CBI comments will be treated in accordance with 40 CFR part 2. A sanitized version of all CBI comments, from which CBI has been deleted, should be submitted to EPA for the public file. It is the responsibility of the commenter to comply with 40 CFR part 2 in order that all materials claimed as confidential may be properly protected. This includes, but is not limited to, clearly indicating on the face of the comment (as well as on any associated correspondence) that CBI is included, and marking "CONFIDENTIAL", "TSCA CBI" or similar designation on the face of each document or attachment in the comment which contains CBI.

XI. Rulemaking Record

EPA has established a record for this rulemaking, [docket number OPTS–42051A]. This record contains the basic information considered by EPA in developing this proposal and appropriate Federal Register notices. EPA will supplement this record as necessary.

A public version of the record, from which all CBI has been deleted, is available for inspection in the OPTS Reading Room, Rm. G–004, NE Mall, 401

M St., SW., Washington, DC 20460, from 8 am to 12 noon, and from 1 pm to 4 pm, Monday through Friday, except legal holidays. The record currently includes the following information:

A. Supporting Documentation

(1) Federal Register notices pertaining to this rule consisting of:

(a) Notice containing the ITC designation of the chemical category of glycidol and its derivatives to the Priority List (43 FR 50630, October 30, 1978).

(b) Rule requiring TSCA section 8(a) reporting on the chemical category of glycidol and its derivatives (47 FR 26992, June 22, 1982).

(c) Rule requiring TSCA section 8(d) reporting on the chemical category of glycidol and its derivatives (47 FR 38780, September 2, 1982).

(d) TSCA test guidelines cited as proposed test standards for this rule.

(e) Notice of final rule on EPA's TSCA Good Laboratory Practice Standards (54 FR 34034, August 17, 1989).

(f) Notice of interim final rule on single-phase test rule development and exemption procedures (50 FR 20652, May 17, 1985).

(g) Notice of final rule on data reimbursement policy and procedures (48 FR 31786, July 11, 1983).

(h) Advance notice of proposed rulemaking for glycidol and its derivatives (48 FR 57562, December 30, 1983).

(i) Notice of Inventory Update Rule (51 FR 21447, June 12, 1986).

(j) Notice of Agency's first and second proposed test rules (45 FR 48510, July 18, 1980 and 46 FR 30300, June 5, 1981).

(k) Notice of proposed rule for chlorinated benzenes (45 FR 48524, July 18, 1980).

(l) Notice of proposed rule for mesityl oxide (48 FR 30699, July 5, 1983).

(m) Notice of proposed rule for cresols (48 FR 31812, July 11, 1983).

(n) Notice of proposed rule for ethyltoluenes, trimethylbenzenes, and C9 aromatic hydrocarbon fraction (43 FR 23088, May 23, 1983).

(o) Notice of final Phase I test rule for mesityl oxide (50 FR 51857, December 20, 1985).

(p) Notice of final Phase I test rule for C9 aromatic hydrocarbon fraction (50 FR 20662, May 17, 1985).

(q) Notice of test rule for diethylenetriamine (50 FR 21398, May 23, 1985).

(r) Notice of test rule for four fluoroalkenes (52 FR 21516, June 8, 1987).

(s) Notice of proposed amendment in test rules for mouse visible specific locus test requirement (53 FR 51847, December 23, 1988).

(t) Notice of final amendment in test rules for the mouse visible specific locus requirement (55 FR 12639, April 5, 1990).

(2) Communications before proposal consisting of:

(a) Written public comments and letters.

(b) Contact reports of telephone conversations.

(c) Meeting summaries.

(3) Reports—published and unpublished factual materials.

B. References

(1) USEPA. U.S. Environmental Protection Agency. Test Rules Development Branch. "Support Document for Glycidol and its Derivatives: Responses to Comments on the Advance Notice of Proposed Rulemaking" (ANPR: December 30, 1983, 48 FR 57562). (December, 1989).

(2) Syracuse Research Corporation. "Draft Final Technical Support Document: Glycidol and its Derivatives." (November 11, 1986).

(3) USEPA. U.S. Environmental Protection Agency. Test Rules Development Branch. "Support Document for Glycidol and its Derivatives: Review of Available Health Effects Data." (October, 1987).

(4) Merck. "The Merck Index (10th Edition)." Rahway, NJ: Merck and Co., Inc., page 4359. (1983).

(5) Lee, H., and Neville, K. "Epoxy resins." In: *Encyclopedia of Polymer Science and Technology*, Volume 6. N.M. Bikales, and J. Conrad, eds. New York, NY: Interscience Publishers, pages 209–271. (1967).

(6) CBI. Confidential Business Information. TSCA Document Control No. 20–874000167. Computer print-out of public and confidential portions of the TSCA section 8(d) Inventory of Chemical Substances (Updated) July 15, 1987.

(7) Personal Communication between Raymond Locke, USEPA Chemical Testing Branch, and Gabrielle Urquhart, Mathtech., Inc., July 1987.

(8) JRB Associates. "TSCA Section 4 Human Exposure Assessment: Glycidol and its Derivatives (Final Report)." (February 4, 1982).

(9) Versar, Inc. "Consumer Exposure to the Glycidols (Draft Final Report)." (December 1, 1983).

(10) NIOSH. National Institute for Occupational Safety and Health. "Criteria for a Recommended Standard: Occupational Exposure to Glycidyl Ethers." DHEW (NIOSH) Publication No. 78–166. (1978).

(11) Stinson, S. "Epoxidation advance may spur its industrial use." *Chemical and Engineering News*, page 24. (June 2, 1986).

(12) Crathorne, B., Fleiding, M., Steel, C.P., and Watts, C.D. "Organic compounds in water: analysis using coupled-column high performance liquid chromatography and soft-ionization mass spectrometry." *Environmental Science and Technology* 18:797–802. (1984).

(13) Capital Systems Group, Inc., and Dynamac Corporation, Enviro Control Division. "Draft Final Subcategorization Scheme for Glycidol Ethers and Esters." (October 26, 1984).

(14) USEPA. Economics and Technology Division. "Economic Impact Analysis of Proposed Test Rule for Glycidol and its Derivatives (Confidential and Non-Confidential Information Versions)." (September 24, 1990).

(15) Booz, Allen Hamilton, Inc., Bethesda, MD. "EPA census of the toxicological testing industry." Prepared for the Office of Policy Analysis, OTS, USEPA, Washington, DC. (June, 1990).

XII. Other Regulatory Requirements

A. Executive Order 12291

Under Executive Order 12291, EPA must judge whether a rule is "major" and therefore subject to the requirement of a Regulatory Impact Analysis. EPA has determined that this proposed test rule, if promulgated, is not major because it does not meet any of the criteria set forth in section 1(b) of the Order, i.e., it would not have any annual effect on the economy of at least $100 million, would not cause a major increase in prices, and would not have a significant adverse effect on competition or the ability of U.S. enterprises to compete with foreign enterprises.

This proposed rule was submitted to the Office of Management and Budget (OMB) for review as required by Executive Order 12291. Any written comments from OMB to EPA, and any EPA response to those comments, are included in the rulemaking record.

B. Regulatory Flexibility Act

Under the Regulatory Flexibility Act (15 U.S.C. 601 et seq., Pub. L. 96–354, September 19, 1980), EPA believes that this proposed test rule, if promulgated, would not have a significant impact on a substantial number of small businesses because: (1) There are only a small number of known small manufacturers, (2) any small processors are not expected to perform testing themselves or to participate in the organization of the testing effort, (3) they will experience only very minor cost in securing exemption from testing requirements, and (4) they are unlikely to be affected by reimbursement requirements.

The definition of small business used under TSCA section 8(a) to exempt from reporting includes any manufacturing/importing firm with annual sales, including sales of any parent firm, below $4 million, or any firm which manufactures the chemical of concern at less then 100,000 pounds annually and has sales, including sales of any parent firm, below $40 million.

EPA is requesting that interested parties submit comments regarding adverse economic impact which may result from testing requirements. Upon

receipt of public comments, EPA will reevaluate the determination that small firms will not be adversely affected by this rulemaking.

C. Paperwork Reduction Act

The information collection requirements contained in this proposed rule have been approved by OMB under the provisions of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., and have been assigned OMB number 2070–0033.

Public reporting burden for this collection of information is estimated to average 22.370 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Chief, Information Policy Branch, PM–223, U.S. Environmental Protection Agency, 401 M St., SW., Washington, DC 20460; and to the Office of Management and Budget, Paperwork Reduction Project (2070–0033), Washington, DC 20503. The final rule will respond to any OMB or public comments on the information collection requirements.

List of Subjects in 40 CFR Parts 704 and 799

Chemicals, Chemical export, Environmental protection, Hazardous substances, Recordkeeping and reporting requirements, Testing.

Dated: October 28, 1991.

Victor J. Kimm,

Acting Assistant Administrator for Pesticides and Toxic Substances.

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